Three Essays on the Dynamics of Disability Benefit Receipt in the Ontario Disability Support Program

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A Thesis Submitted to the School of Graduate Studies
in Partial Fulfilment of the Requirements for the Degree Doctor of Philosophy

McMaster University DOCTOR OF PHILOSOPHY (2018) Hamilton, Ontario (Economics)

TITLE: Three Essays on the Dynamics of Benefit Receipt in the ODSP

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NUMBER OF PAGES: xi, 136

Abstract

This thesis focuses on the dynamics of benefit receipt in the Ontario Disability Support Program (ODSP) using individual level administrative data from 2003 to 2013. This thesis is comprised of three self-contained essays.

The first essay examines the dynamics of disability benefit receipt in Ontario. A five-year cohort analysis is carried out for those who first received disability benefits in any year between 2004 and 2009 to estimate the proportion exiting from such benefits within five years of first benefit receipt. This analysis is extended to type of exit (e.g., died, moved, or disqualified) and nature of exit (e.g., sustained or temporary). We find that only about 18 percent of benefit recipients exit, most within one and a half years of initial benefit receipt, and that more than one-third of those who exit return within five years. Recipients are both less likely to exit and more likely to return if single, divorced, or widowed rather than married or living common law, if they have children, or if they have mental rather than physical disabilities.

The second essay identifies factors that influence ODSP benefits duration. We employ a flexible parametric technique to investigate the duration of disability benefit receipt. We also employ cure models to account for the proportion of recipients that never exit ODSP over the ten-year sample period. Of the whole sample, 20 percent of recipients completed a first spell and the remaining 80 percent were right censored. We find that time spent receiving ODSP benefits is negatively associated with education and positively associated with both age and severity of disability. Individuals who are single, divorced, separated, widowed, or immigrants have longer benefit spells as compared to those who are married, common law, and Canadian born. Individuals with children also spend longer time on ODSP than those relative without children. We provide evidence that recipient characteristics are associated with different probabilities of exiting or re-entering ODSP; that suggests that differentiated, and not 'one size fit all', policies are required to facilitate transitions from program dependence to economic independence.

The third essay analyzes differences in the benefit receipt rates by immigration status and age. A flexible parametric duration analysis is employed to investigate how age at entry into benefits interacted with

immigration status and, for immigrants, how age at arrival in Canada affects the exit rate from disability support. We find strong evidence of differences in age-dependence of benefit receipt and exit rates across immigration status categories. At younger (18-34) and middle (35-54) ages the Canadian-born have much higher benefit receipt rates than immigrants but lower rates at older (55 and over) ages. We speculate that the difference at younger and middle ages can be explained largely by the "healthy immigrant effect" (i.e., a selection effect of relatively healthier immigrants) and at older ages by differential eligibility for, and expected income from, alternative benefit programs such as the Canada Pension Plan, Old Age Security, and the Guaranteed Income Supplement.

Acknowledgments

I owe my profound thanks to Almighty Allah - The Merciful - who blessed me with determination, potential and ability not only to complete this thesis but also blessed me in countless ways throughout my life.

I have great pleasure in extending my sincere thanks to my supervisory committee, Byron Spencer, Arthur Sweetman, Kate Cuff and Emile Tompa for their dedicated help, continuous support and skillful guidance. I would like to thank faculty and staff in the department especially Alok Johri, Svetlana Demidova and Stephen Jones, all of whom have played a significant role in my PhD journey. I would also like to thank my doctoral program colleagues, especially Shaun Shaikh, for their friendship and support. My special words of thanks should also go to the analysts at the McMaster RDC, Peter Kitchen and Mustafa Ornek for their continued help. I also wish to thank the Ontario Ministry of Community and Social Services (MCSS) for access to the data used in this thesis. Financial assistance from the department of economics and a scholarship from the Centre for Research on Work Disability Policy is also acknowledged.

Finally, I would like to thank my family for their love and moral support. My family has always been extremely supportive of me and have made countless sacrifices. My special thanks go to my wife for her unconditional love, eternal support and aspirations. I would not have been able to complete this work without her patience, sacrifice and understanding of my goals.

I also owe my deepest gratitude towards my parents for their infallible love and affection that will remain my inspiration throughout my life. I dedicate this work to my late father who always believed in me and encouraged me to follow my dreams.

Declaration of Academic Achievement

Chapter 1 is co-authored with Byron Spencer and Arthur Sweetman, Chapter 2 with Emile Tompa, and Chapter 3 with Arthur Sweetman. I conducted all the empirical analysis as well as writing of the manuscripts.

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Introduction

The Ontario Disability Support Program (ODSP) is a means-tested income and employment assistance program for disabled persons 18 and older. Applicants are subject to tests of residency, income, assets, and disability; those eligible must be resident in Ontario, in financial need (i.e., have little or no other income and assets worth less than $40,000), and have mental or physical impairment that is expected to last for at least one year and that restricts their ability to care for themselves, function in the community, or work. ODSP, unlike Ontario Works, has no mandatory work requirements and benefits continue for those who remain eligible.

Since its inception in 1997, ODSP has been subject to rapid increases in benefit receipt. John and Tweddle (2012) and John et al. (2014) state that ODSP is the largest and fastest growing of all the disability benefit and social welfare programs in the province. Between 2003-04 and 2016-17 ODSP spending increased 4.1 percent per year, accounting for about 3.3 percent of provincial expenditure. The caseload increased at an average growth rate of 5 percent per year between 2003 and 2013. On a per capita basis this represents an increase from 2.13 to 2.86 percent of the Ontario population 18 and older. To a large extent this growth reflects the increase in the number of people entering the program and a decrease in the number leaving the program.

The continued growth in the number of recipients of ODSP is a public policy concern. In part, this reflects the implications for the public budget of having over 300,000 individuals in receipt of ODSP at a time when the budget deficit is very high on the public policy agenda. A related concern is that ODSP engenders dependency; once on disability benefits, most recipients tend to stay on benefits until they become eligible for a pension or die (Cheadle et al. 1994).

The challenge for ODSP policy makers is to understand the dynamics of ODSP benefit receipt to enhance their ability to predict the future growth and program costs to better mange the program. Despite its potential importance for social policy, little is known about the dynamics of ODSP benefit receipt. This thesis focuses

on understanding the growth of disability benefits receipt - the evolution of benefit receipts, transition rates and the length of time recipients remain on the rolls, taking into consideration the characteristics of those who enter and exit the program. Along with extensive descriptive analysis, econometric techniques are applied to administrative data on ODSP recipients from 2003 to 2013 to improve our understanding of socioeconomic and demographic factors associated with the ODSP benefit receipt, and especially with the exit process from and re-entry into ODSP. This thesis is comprised of three self-contained chapters.

The first chapter, "The Dynamics of Benefit Receipt in the ODSP", analyses the dynamics of disability benefit receipt in Ontario from 2003 to 2013 in three steps, focusing on the dynamics of benefit receipt, exit, and the type and nature of exit. The first is purely descriptive: it provides insights into trends in the aggregate caseload and the inflows and outflows associated with that caseload. A five-year cohort analysis is carried out for those who first received disability benefits in any year between 2004 and 2009 to estimate the proportion exiting from such benefits within five years of first benefit receipt. This analysis is extended to type of exit (e.g., died, moved, or disqualified) and nature of exit (e.g., sustained or temporary). The second focuses on differences in exit behaviour across groups defined by demographic and contextual characteristics in a spell-based perspective of the transition out of ODSP. Multinomial regression analysis is carried out to investigate the determinants of the type and nature of exits. Finally, logit regression is employed to investigate the impact of the history of benefit receipt on benefit receipt persistence.

We find that only about 18 percent of benefit recipients exited within five years of their first spell. However, of those who exited about 38 percent returned to benefits within five years. We also find a clear association between the characteristics of benefit recipients and benefit receipt rates, transition rates and the types and nature of exit. For instance, recipients with mental disorders have the highest entry rate, the lowest exit rate, and the highest rate of return after a first non-death exit.

The second chapter, "Length of Time on and off the ODSP Benefits: A Flexible Parametric Duration Model", identifies factors that influence ODSP benefits duration. Understanding the factors influencing the length of time recipients remain on the rolls is of vital importance, as these factors may influence program

costs. Moreover, prolonged duration on disability benefits may reduce recipients' chances to leave the benefits (Kapteyn et al. 2008, Galarneau and Radulescu 2009, Oguzoglu 2010). Given the high costs to society and to the disabled, long disability benefit duration is a serious public policy concern. To this end, this paper fills a critical knowledge gap by undertaking an empirical analysis of the factors influencing the length of time on/off ODSP.

In this chapter, I have analysed the duration of ODSP benefit receipt of individuals aged 18-54 in Ontario using administrative data files from 2003 to 2013. I have employed flexible parametric models to explore benefit duration from three different angels; time spent receiving benefits, cure rates, and time spent not receiving benefits. The first analysis provides insight into duration on benefits (on spells) followed by the cure rate analysis that re-affirms these findings. Finally, the dynamics of the nature of first exit and re-entry to benefits (off spells) after a first non-death exit are studied.

The estimation results show a clear association between the time invariant individual characteristics of benefit recipients and the duration of benefit spells; On-spells (off-spells) tend to be longer (shorter) for those with mental disorder who are younger, less educated, single, and have children. The results suggest that issues related to length of time on/off disability benefits, especially potentially prolonged stays, will be of increasing importance in ODSP policy discussions.

The third and final chapter, "Immigrant Use of the ODSP: A Duration Analysis", analyzes differences in the benefit receipt rates of the ODSP by immigration status and age. Immigrants' contribution compared to the fiscal burden they cause is the subject of much disagreement among economists (see Akbari 1989; Razin et al. 2011; Javdani and Pendakur 2014; Grubel and Grady 2011; Grubel 2016). Although Canadian immigration policy has been seen as largely successful compared to many European countries and the use of welfare benefits by immigrants has rarely been politicized (Koning 2012), advocacy for relatively more or less open immigration policies inevitably must account for the marginal benefits and costs of such decisions to the host country. One aspect of the public costs of immigration is the immigrants' use of public support programs including disability benefits.

The immigrant segment of the Ontario population has been growing markedly. Further, the rapidly growing Ontario immigrant population is also rising in numbers of older immigrants (55 and older). Such shifts in the population distribution of immigrants inevitably translate into health-related pressures on the public sector, including disability support programs. Understanding such demographic pressures on the ODSP is essential to ascertaining its ongoing financial viability. Given that Ontario has the highest concentration of immigrants in Canada, it is important to zoom in on the specific relationship of immigration, age, and ODSP benefit usage.

Despite its potential importance for social policy no previous analysis of this question has been undertaken. Chapter 3 focuses on immigrants use of ODSP benefits. A flexible parametric duration analysis is employed on administrative data from 2003 to 2013 to investigate how age at entry into benefits interacted with immigration status and, for immigrants, how age at arrival in Canada affects the exit rate from disability support.

We find that the rate of benefit receipt varies with age, but in ways that differ between immigrants and the Canadian-born. Immigrants are, on average, 10 years older at the time of entry into benefits. While the benefit receipt rates are higher for the Canadian-born at younger and middle ages, they are lower at older ages. We also find that the benefit duration of immigrant recipients is positively associated with age at immigration; those who arrived in Canada at older ages are less likely to exit from benefits than those who arrived at younger ages. The estimation results show a clear association between the probability of exit and both immigration category and current immigration status. Immigrants who entered benefits as permanent residents or Canadian citizen are much more likely to exit than are refugees. Moreover, immigrants who arrived in Canada as economic class are more likely to exit than family class or refugees. These results can have implications for both immigration and social welfare policy that need to account for age-specific behaviour of potential immigrant applicants.

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Chapter 1

The Dynamics of Benefit Receipt in the ODSP

1.1 Introduction

The Ontario Disability Support Program (ODSP) is the largest and fastest growing of all the disability benefit and social welfare programs in the province (John et al. 2014, John and Tweddle 2012). ODSP spending for 2017-18 is estimated to be $5.1 billions as compared to $2.9 billions (in 2007 constant dollars),[1] in 2003-04, an increase of 4.1% per year and accounting for about 3.3 percent of provincial expenditure.[2] As seen in Figure 1.1, with inflows higher than outflows, the caseload increased from fewer than 200,000 to over 300,000 between 2003 and 2013, an average growth rate of 5 percent per year. On a per capita basis this represents an increase from 21.3 to 28.6 recipients per 1000 population 18 and older.

The continued growth in the number of recipients of ODSP is a public policy concern. In part, this reflects the implications for the public budget of having over 300,000 individuals in receipt of ODSP at a time when the budget deficit is very high on the public policy agenda. A related concern is that ODSP may engender dependency; once on disability benefits, most recipients tend to stay on benefits until they become eligible for a pension or die (Cheadle et al. 1994).

Although both higher inflows and lower outflows have contributed to the growth in ODSP, the policy focus has been on how to reduce the inflows by influencing eligibility criteria and payment parameters. This is in keeping with the concern about both the adverse long-term effects of disability benefit receipt and the ever-growing cost of the program. Although exit from disability benefits is not very common, international evidence (e.g., Adam et al. 2008 and Banks, Blundell, and Emmerson 2015) suggests that policies promoting outflows could play a role in reducing disability support dependence, hence a motivation for this

[1] Financial and employment support only. Operating and other related expenses (e.g. drug benefits) are not included.
[2] Ontario Ministry of Finance Budget Estimates, https://www.fin.gov.on.ca/en/budget/estimates/2004-05/volume1/MCSS.pdf and https://www.ontario.ca/page/expenditure-estimates-ministry-community-and-social-services-2016-17.

paper. We make use of administrative data on ODSP recipients to improve our understanding of socioeconomic and demographic factors associated with the ODSP benefit receipt, and especially with the exit process from and re-entry into ODSP.

To investigate the exit from and re-entry into ODSP, we consider first selected descriptive features of recipient dynamics, starting with the inflows and outflows of beneficiaries by demographic group: Who receives benefits? Who remains on benefits, who exits and, among those who exit, who cycles back? Following on from the descriptive analysis, we then estimate models; multivariate models to investigate the association of recipient characteristics with various exit types and logit models to investigate the duration dependence -- whether the behaviour of the first-time entrants differs from that of the recipients with some benefit history. In doing so, we build on earlier international studies (e.g., Hennessey and Dykacz 1989; Cai et al. 2008; and Louwerse et al. 2018). These studies addressed the role of outflows as well as inflows in the context of disability programs similar to ODSP in determining the growth in the stock of participants and the associated costs.

Cai et al. (2008) examined outflows in the context of disability programs using a 50 percent sample of the administrative records of recipients of the Australian Disability Support Pension over the period 1995 to 2002. Among the exits, 39 percent returned to work, 9 percent were disqualified due to excess income or assets, and 10 percent were disqualified due to non-compliance. Another 15 percent exited for other reasons. Aside from those who died or transferred to another welfare program, about 50 percent of exits returned to receive benefits within two years.

Louwerse et al. (2018) examined the socio-demographic characteristics of disability benefit recipients of the Dutch Social Security Institute (SSI) that were associated with recipients' outflow from the benefits. Disability diagnoses differed across age and education categories; elderly and less educated individuals were mainly diagnosed with physical disorders whereas mental disorders were the main diagnoses for younger and more highly educated individuals. Most recipients, 82%, continued their benefits in the five-

year follow-up period. Continuation was much higher for recipients with mental disorders than for those with physical ones. Similarly, older recipients stayed on benefits about four years longer than younger ones.

Several Canadian studies (e.g. Barrett and Cragg 1998, Charette and Meng 1994, Christophides et al., 1998, Fortin and Lacroix 1997, Duclos et al., 1999, Lacroix 2000, Barrett 2000, and Fortin et al. 2004) have focused on the dynamics of social assistance receipt using provincial administrative files, but only a few have, to some extent, considered disability programs. For instance, using social assistance administrative data for the period 1990 - 1994 from the Ontario Ministry of Community and Social Services (MCSS), Dooley and Stewart (1999) studied the receipt of welfare benefits and the duration of welfare spells among lone mothers in Ontario.[3] They find longer spells for younger, less educated, never married and disabled lone mothers and those longer periods on welfare lead to longer future spells on welfare and shorter future spells off welfare. Although, they considered disability benefits recipients along with social assistance recipients, their scope was limited to single mothers.

Understanding the dynamics of ODSP benefit receipt is necessary for informed disability policy. For instance, the features of an effective program, such as one that facilitates a successful transition from disability benefits to work (e.g. through ODSP employment support benefits), are likely to be different for a person who is young, has a mental disorder, little education and no work experience than for one who is older, has a physical disorder, is better educated, and has work experience. Such distinctions have generally gone unrecognised and disability is largely understood only in a static sense (Burchardt 2000). Walker and Ashworth (1994) warn that a static concept of disability may lead to unrealistic policy responses.

Despite its potential importance for social policy, little is known about the dynamics of ODSP benefit receipt. In what follows we focus on the evolution of benefit receipts and transition rates (the inflows and outflows), taking into consideration the characteristics of those who enter and exit the program. Section 1.2 provides a brief description of the data, including key definitions. ODSP benefit receipt dynamics are

[3] Includes the claimants of short-term assistance provided under General Welfare Assistance Act (GWA) and claimants classified as ‘disabled’ or ‘sole support parent’ under Family Benefit Act (FBA).

studied in section 1.3. The exits from ODSP are analysed in section 1.4 and duration dependence in section 1.5. Section 1.6 concludes with a summary and a discussion of policy implications.

1.2 Data Description and Key Definitions

Ontario operates two means-tested social welfare programs, Ontario Works and the Ontario Disability Support Program (ODSP), to meet the income and employment needs of people. ODSP provides income support to persons 18 and older with disabilities and also provides assistance in preparing for and finding employment along with other health related benefits.[4] Applicants are subject to tests of residency, income, assets, and disability; those eligible must be resident in Ontario, in financial need (i.e., have little or no other income and assets worth less than $40,000), and have mental or physical impairment that is expected to last for at least one year and that restricts their ability to care for themselves, function in the community, or work. Those ineligible for disability benefits from the Canada Pension Plan as well as those in receipt of partial disability benefits are eligible for ODSP benefits. Since the process to determine financial need and disability status can take several months, those in dire need of financial assistance may (and usually do) start by applying for financial assistance from Ontario Works. ODSP, unlike Ontario Works, has no mandatory work requirements and benefits continue for those who remain eligible.

We work with ODSP administrative data files that provide individual-level monthly records from 2003 to 2013 of the amount and type of benefits received, including employment support, and the demographic and contextual characteristics of recipients including their sex, age, family structure (marital status, number of children), education, immigration status, accommodation, and disability type. We exclude the very few benefit recipients who are reported to be under the age of 18 and, following the parameters of the program, have no upper age limit.[5]

[4] A detailed description of the ODSP is provided in Appendix IV.

[5] Applicant must be 18 years of age or older, and those 65 years of age or older who are not eligible for a pension under the Old Age Security Act can also apply.

The benefit entry date could be estimated using the *date of application* field, but we found many instances of inconsistencies. Importantly, the policy on the payout for the time from application to approval (i.e., the waiting period) changed in September 2006 when the "4-month rule" was revoked. It had stipulated that the maximum reimbursement of the difference between disability and social assistance benefits in the waiting period would cover a maximum of four months. We avoid trying to account for differences in the waiting period by using the approval date as the date of entry into benefit coverage because most ODSP applicants received social assistance while their cases were adjudicated since the disability test takes longer to process than the other tests. Moreover, ODSP benefits have been markedly higher, about 70 percent, than base social welfare rates recipients (John et al. 2014).[6]

Exit dates are complicated due to data definitions related to recipient status (active, not active). For instance, if benefits are suspended temporarily (for a period that may be up to one year) for administrative reasons, the status ('active') and termination reason ('continue') remain unchanged even though the recipient receives no benefits. The recipient is considered to have exited only if terminated permanently and then a termination reason such as 'left', 'died', or 'moved' is provided. We therefore prefer to use the payment record to define exit and any subsequent re-entry. By our definition, an exit occurs if there is a break of at least two consecutive months in benefit payments. This "two-month rule" is used elsewhere to define spell/exit; a common view, supported by the literature (e.g. Dooley and Stewart 1999, Barrett 2000), is that payment gaps shorter than two months often result from administrative processes and may not represent true exits.[7]

Our analysis focuses on recipients when they enter the system for the first time. To identify this group consistently over the data period and avoid left censoring (e.g., those with benefits in 2013 would have 10 years of possible previous spells whereas those with benefits in 2004 would have only one previous year)

[6] Time to approval by application and approval year are shown in Figure A3 in Appendix I.
[7] Monthly entries, exits, and year end caseload based on one-month-rule are presented in Figure A1 and the ratios of monthly entries, exits, and year end caseload based on one-month rule to entries, exits, and year end caseload based on two-months rule are presented in Figure A2 in appendix I.

we define first entry to include individuals in receipt of benefits in one calendar year but not in the preceding year. This definition makes the measure consistent over time, comparable across cohorts, and avoids artificial trends associated with the observed first spell.

This approach, however, may introduce measurement error since some will have received benefits more than one year earlier and hence not be true first entrants. To get a sense of how large this group might be we count the number of new entrants (by our definition) in 2013 who had benefits at any time in the previous 10 years, and hence were not truly first entrants. We find that only 6 percent of our 2013 first entry cohort (i.e., those with no receipt of benefit in 2012) had been on ODSP sometime between 2003 and 2012. Thus, our definition of first spell seems a reasonable approximation of a genuine first spell.[8]

Our dataset provides a rich set of covariates that might help to explain exits. In addition, it provides information on exit type, which can be important in the analysis of disability exit rates but is not often considered in the literature. The termination reasons are classified into five broad exit types: No Exit, Died, Excess Income/Assets (if exit is due to excess income or assets), Disqualified (if exit is due to reasons other than excess income or assets such as moved, not disabled, fraud, non-compliance, etc.) and Other exit (if the exit is voluntary and not due to death, excess income/assets or disqualification). Our primary interest is in the impact of recipient characteristics on the probability of 'Other exit' because it, presumably, largely accounts for exit to work. This information makes possible the multinomial logistic regression analysis reported in section 1.4.

A primary determinant of the exit rate, one whose effect may differ across exit types, is the disability itself. For instance, some disabilities may have high mortality, affecting exit primarily through death, while others may severely affect functional limitations and be associated with specific labour market outcomes. For instance, people with cognitive and mental disorders have been found to face greater employment challenges than people with sensory and other physical disabilities (Arim, 2015). Of course, people with

[8] See Figure A4 in Appendix I for details.

more severe disabilities have significantly lower employment rates than those with less severe disabilities (Turcotte, 2014). According to the Canadian Survey on Disability in 2012 only 12 percent of people with disabilities were employed; the rates ranged from 18.6 to 12.0 to 9.6 percent for those with mild, moderate and severe disabilities, respectively. In what follows we can account for the nature or type of the one disability status as recorded at the time of enrolment, but not for its severity or for comorbidities, or any other aspect of how the disability might evolve over time.

In our dataset, disability type is encoded using the International Classification of Diseases, 9th revision (ICD 9) codes and we use that terminology. In this system, disability types fall into 17 broad categories.[9] We group them into five: Mental Disorders, Musculoskeletal Disorders, Nervous System and Sense Organ Disorders, Circulatory System Disorders, and Other. The first four categories are ordered from largest to smallest based on the number of recipients in the sample; the last, "Other" combines the remaining 13 disability categories (each one accounts for less than 3 percent of recipients).[10]

Since disability increases with age, inflows would be expected to increase; Cai and Gregory (2004) find a small but positive impact on the Australian Disability Support Pension. But, with access to other income support programs, such as old age security, it could also have positive impact on outflows and it is not clear which effect is stronger. In a study of the Dutch disability program, Buddelmeyer (2001) finds that older people are more likely to receive disability benefits whereas younger and more educated men with relatively high earnings are more likely to leave them.[11] Duggan and Imberman (2009) report that disability insurance receipt strongly increases with age; in the US those aged 50 - 64 are five times more likely to claim disability insurance than those 20 - 49. McVicar and Wilkins (2013) find that population aging accounts for much of the growth in the number of the disability recipients in Australia between 1982 and 2011.

[9] http://icd9.chrisendres.com/index.php?action=contents.
[10] This ensures that MCSS requirements relating to minimum cell size for disclosure are satisfied.
[11] For the Dutch Disability program, disability is defined as a loss in income capacity but not as a conventional disability.

Although age and some other explanatory variables may vary over time, we assess their impact as measured at the time of entry; hence they are treated as time invariant for analysis. Age at entry is treated as a categorical variable to allow ease of interpretation and flexibility for capturing non-linear effects. Although the age of onset of disability may be important as a determinant of exit, this information is not available.

Family structure, including marital status, may also have an impact on exit. For instance, we anticipate that those married or living common law are more likely to exit due to excess income or assets as compared to those who are divorced, separated or widowed. The presence and number of children may also have an impact on exit. Many studies find that single parents with children are less likely to exit than are couples with or without children. Four dummy variables are created to represent this additional aspect of family structure: couples with and without children and singles with and without children.

Studies have found higher rates of disability benefit use among immigrants than among natives (e.g. Reinans 1987, Kindlund 1995 and 2001, and Osterberg and Gustafsson 2006), especially in the US and European countries. For instance, Osterberg and Gustafsson (2006) found higher rates of disability pension claims in Sweden between 1981 and 1999 among immigrants than among the native-born; it also found that the probability of being on a disability pension increased with years since migration. We classify recipients based on their immigration status into Canadian-born and Immigrant.

Several studies (e.g., O'Neill et al., 1987; Blank, 1989; Fortin and Lacroix, 1997; Barret, 2000) have found that exit from benefits increases with the level of education. We have classified the available information on educational attainment into four groups based on the number of years of schooling: Middle school (0 - 8), some high school (9 - 11), high school (12 - 13), and Post-Secondary.

Pudney (2010) finds that in the UK older homeowners are less likely than older renters to claim disability benefits (specifically, the so-called Attendance Allowance). We can identify recipients who live in subsidized housing, a factor that has received little attention, but which might affect exit rates because of the differential effect of incentives. For instance, an increase in earned income exemptions is more attractive

for those in rental or owned accommodation than those living in subsidized housing, suggesting that there is less incentive for those in subsidized housing to participate in the labor market and hence to exit disability benefits. To account for the accommodation differences, we have classified the sample into four groups: Subsidized Housing, Rented, Owned, and Other Accommodation. Combined in the last category are boarding and lodging, nursing homes, and community resource centers, each of which accounts for only a small proportion of recipients.

1.3 Dynamics of Benefit Receipt

As mentioned, while several studies have been concerned with the dynamics of social assistance receipt, few have focused on those with disabilities. We consider first selected descriptive features of recipient dynamics, starting with the inflows and outflows of beneficiaries by demographic group: Who receives benefits? Who remains on benefits, who exits and, among those who exit, who cycles back? Later sections relate mostly to exit rates and include multivariate modelling.

1.3.1 Benefit Receipt Rates

Starting with benefit receipt and focussing on the inflow and outflow trends at the aggregate level, we employ an 'end of year' approach, commonly used in the literature, to construct benefit receipt rates.[12] The disability benefit receipt rate (Receipt Rate hereafter) is the caseload, defined as the number of individuals on disability benefits in December per 10,000 of the mid-year population age 18 and older. Formally, $Receipt\ Rate_t = \frac{Benefit\ Recipients_t}{Population_t} * 10{,}000$. The entry rate is the number of recipients per 10,000 population in t who were not in receipt in t-1; the exit rate is the number of recipients in t-1 who were not in receipt in t as a percentage of the year end caseload.

[12] Some studies use a "benefit year" approach that classifies as a recipient any person who has received benefits at any time during the calendar year. This approach leads to over estimation of the caseload.

Table 1.1 shows the annual entries, exits and end-of-year caseloads, separately for males and females as well as both sexes combined, with levels in Panel A and rates in Panel B. We observe that the number of entrants has grown in most years. As implied in Panel B, the growth in entrants has exceeded the growth of the (not age-adjusted adult) population over the period but has been relatively flat at 31 or 32 per 10,000 population since the recession of 2009. There was slower growth in the number of exits, such that the exit rate (exits as a percent of the year-end caseload) has declined somewhat. The net result is a 54 percent growth over the data period in the caseload; by 2013, 2.86 percent of the population 18 and older was in receipt of ODSP benefits. Finally, we note that the patterns are broadly similar for males and females, but that males are somewhat more likely to receive benefits.

Table 1.2 reports benefit receipt rates for the years 2003 and 2013 for specific groups of interest; the purpose is to provide an indication of how recipient characteristics and program coverage have changed.[13] The measures highlight both the heterogeneity of benefit recipients and the universality of the program. Panel A provides rates by disability type, exit type, and accommodation type; Panel B provides rates corresponding to age group, education level, family structure, marital status, and immigration status.

From Panel A, we see that mental disorders are the largest disability group, accounting for more than half of all recipients by 2013; that category also witnessed the most rapid growth over the last decade (4.2 percent per year, on average). In distant second place is the residual category 'other' followed by 'musculoskeletal'. These results hold for both men and women. In terms of exit types, the biggest average annual growth, 3 percent, is in the "no exit" category. Rented is the largest accommodation group and the one that has experienced the most rapid growth, of over 4 percent. Perhaps contrary to common perception, recipients living in subsidised housing constitute the smallest accommodation group and one with slow (0.6 percent) average annual growth.

[13] We looked at the benefit receipt rates for other years that generally change with no obvious substantial jump.

Benefit receipts are highly concentrated in older age groups below age 65; starting at age 65 most recipients become eligible for other benefits programs such as Old Age Security; see Panel B. The fact that benefit receipts are highly concentrated in older age groups is consistent with the notion that disability increases with age. However, the benefit receipt rate for younger age recipients increased the most, by 4.9 percent annually on average, suggesting that demographic pressures alone are not solely responsible for the increased caseload.

Benefit receipt is seen to decrease with level of education. The evidence is that benefit recipients are highly concentrated in education groups 0 - 8 and 9 - 11, which is consistent with other findings in the literature. The direction of causation is not clear since it is evident that the onset of disability at a young age could limit educational opportunities, thereby exacerbating problems with employability. Although benefit recipients are concentrated in the lowest education group (0-8), the benefit receipt rate in that category decreased by 3 percent annually on average. This is consistent with improved access to educational opportunities for individuals with disabilities, especially at younger ages.

The presence of a partner and/or children is also associated with the likelihood of receiving disability benefits. The literature (e.g. Cai and Gregory 2005, Joung et al. 1994) suggests that never married, separated, divorced, and widowed individuals are more likely to be on benefits than couples; that is the pattern shown in Table 1.2. Those in the former group are about eight times more likely to be recipients than those who are common law or married.

By 2013 the Canadian-born accounted for 78 percent of recipients and immigrants for 22 percent. However, the 2013 benefit receipt rate for Canadian-born was much higher (339 per 10,000) than for immigrants (188 per 10,000) even though it had grown more slowly (2.7 vs 4.3 percent annually between 2003 and 2013). The caseload percentage distribution is presented in Table A2 in Appendix I.

1.3.2 Entry Rates

Table 1.3 follows a structure parallel to Table 1.2, but with the sample restricted to first spell entrants. Accordingly, we define the entry rate (ER) as the number of individuals not in receipt of benefits in the preceding calendar year who are in receipt in the current year per 10,000 population. Formally, $ER_t = \frac{First\ Entry_t}{Population_t} * 10{,}000$. Entry rates for the years 2004 and 2013 along with average annual percentage changes are presented in Table 1.3. Consistent with the increased caseloads shown in Tables 1.2, the rate of first entry was considerably higher in 2013.

While Table 1.3 relates only to new entrants and Table 1.2 to the entire caseload, the stories are similar. As shown in Panel A, among disability types, the fastest growing rate is among those with mental disorders -- an average annual increase of just under 5 percent (6 for men, 4 for women). By type of accommodation, renters have the highest entry rate with an average annual increase of 3.6 percent between 2004 and 2013. In contrast, homeowners have the lowest entry rate but the highest growth rate, at just under 4 percent. Few entrants live in subsidized housing and the growth rate is negative.

Panel B presents entry rate for group-specific populations. The entry rate for singles with children is 8 times higher than for couples, and about 25 times higher if they have children. The rate for singles is growing at a much faster rate than couples. Within the family structure categories, those who are divorced, separated and widowed have the highest entry rate but the rates among never married recipients is growing at a faster rate.

Both the benefit receipt and entry rates generally increase with age (the youngest age group is an exception) and decrease with education. Substantial increases in the entry rates occurred between 2003 and 2013 in most categories. Singles, with or without children, have the highest rates of entry and of growth. Finally, the entry rate for immigrants in 2013 was much lower (23 per 10,000) than for Canadian-born (32 per 10,000), especially for males and the gap in the entry rates between Canadian-born and immigrants increased markedly between 2004 and 2013.

1.4 Dynamics of the Type and Nature of Exit

What factors are associated with *sustained* exits? Understanding the determinants could help to inform public policy since temporary exits are distinct from permanent ones and engender different policy responses.

1.4.1 Descriptive Statistics of the Type and Nature of Exit

Given the available data, it is useful to compare the 2004 and 2009 calendar year entry cohorts since each can be tracked for five calendar years. According to our definition of first entry, these are the individuals who first received benefits in either 2004 or 2009, meaning that they were not in receipt of benefits in the preceding calendar year. We focus on the benefit receipt behaviour of the 2004 and 2009 entry cohorts for the next four calendar years, to the end of 2008 and 2013 respectively (i.e., each individual is followed for at least four years and one month, and at most five years). As defined earlier, a benefit spell ends if a recipient leaves benefits for at least two consecutive months. The first such occurrence we define as the first exit and classify it, based on termination reason codes, as one of five types. The first four are: Died, Excess Income/Assets, Disqualified, and 'Other Exit'.[14] The category 'other exit' is our prime focus as it accounts for more than four-fifths of the (mostly voluntary) exits from disability benefits. The fifth, No Exit, applies if the spell continues to the end date, that is, any interruption in payments lasts for no more than two consecutive months.

Table 1.4 presents the distributions of the 2004 and 2009 entry cohorts for both sexes combined, by exit categories and recipient characteristics along with the share of individuals who return after the first non-death exit.[15] For each entry cohort, the first column shows the number of entrants; the second shows the percent who received benefits for the entire five-year period, and the next two show the percent exiting at

[14] In Table 1.4 the exit categories 'died', 'excess income/assets' and 'disqualified' are aggregated into 'Died/Disqualified' because the cell sizes are small. However, all exit types are used in the multivariate analysis that follows.

[15] There are little differences between male and female recipients; full information is provided in Appendix I, Tables A4 and A5.

least once and the reason for that exit. The last column shows the percent of non-death exits who return to benefits within the observational window of five years.

Although there are some differences, the overall picture is one of relative stability in exit and return rates for the 2004 and 2009 cohorts despite differences in relation to the stage of the business cycle. At the aggregate level, almost 80 percent did not exit; they received benefits throughout the entire five-year period. Of those who did exit, more than one-third returned within the five-year window. Looking across the characteristics, those with disability type "mental disorder" were least likely to exit and, among the 11 or 12 percent who did exit, were most likely to return. The exit proportions increase with age but, among the exits, the proportions returning decrease with age. The exit proportions also increase with education (aside from the lowest education level); those in the lowest education groups are most likely to exit and, among those who have, least likely to return. The high concentration of those in the lowest education group at older ages could be a partial explanation of this phenomenon

Couples are more likely than singles to exit and those with children are less likely to exit than those without. At the same time, among those who exit, couples are more likely than singles to return, especially in the later entry cohort. Those never married are least likely to exit and, if they do, about 4 in 10 return. Immigrants are more likely than the Canadian-born to exit and, if they do, less likely to return. Owners are more likely than renters to exit and, if they do, more likely to return.

To look for changes over time, Table 1.5 provides summary information on five-year exit rates for new entrants comparable to those in Table 1.4 for each entry cohort from 2004 through to 2009. Aside from the 2008 cohort, when there was a slight reduction, the entry cohorts have increased in size each year. However, about 80 percent of the entrants from each cohort were still receiving benefits five years later. Of the 20 percent who exited for reasons other than death, about 4 in 10 had returned within the five-year period. The 2009 entry cohort was something of an exception, in that the return rate was about 4 points lower than the average of the previous four years. The reason for this is not clear.

1.4.2 Multivariate Modelling with Multinomial Outcomes

We employ the Multinomial Logit (MNL) model to investigate the association of recipient characteristics with each exit type; it uses a linear combination of variables to explain the relative risk of being in one exit category relative to a reference category.

While MNL models are simple to estimate, the overwhelming number of coefficient estimates complicates interpretation. As an informative summary of the change in response associated with a change in each covariate we report the mean marginal effects (MME) – an estimate of the change in the response variable for a one-unit change in an explanatory variable, holding all other variables constant.[16] Since all our explanatory variables are categorical, the change in predicted probabilities is associated with a change in a categorical variable from 0 to 1. The marginal effect is computed at the observed value for each observation in the sample and then the mean is taken (i.e. MME = mean of marginal effects). We investigate the five exit types noted above.

We estimate MNL models for the sample comprised of individuals who commenced their first spell during each calendar year from 2004 to 2009 (the 2004 through 2009 entry cohorts) with an observational period of five years. We restrict our sample to these entry cohorts in order to have consistent definitions of first entry and first exit.

1.4.3 Multivariate Model Results

The MMEs of the MNL results for both sexes combined are presented in Table 1.6.[17] The reference group for each explanatory variable is indicated in the 'explanatory variables' column; for example, 'mental disorder' is the reference category for 'disability type'.

Our focus is on the 'no exit' arm of the MNL, which accounts for about 80 percent of first entrants, and on the exit category 'other', which accounts for more than 80 percent of all exits. Other exit is of primary

[16] Coefficient estimates are provided in Appendix I, Table A6.3.
[17] The results for females and males separately are provided in Appendix I, Tables A6.1 and A6.2.

interest because it largely represents voluntary withdrawals from benefit, perhaps for work. Recipient characteristics are generally found to affect exit types especially 'no exit' and 'other exit'.

Among disability categories, mental disorder is least likely to exit. By way of example, holding other things constant, a person with a musculoskeletal disability is, on average, 3.1 percentage points more likely to exit the receipt of benefits (less likely to be in the 'no exit' category) than one with a mental disorder. Note that the sum of the percentage point probabilities associated with the four exit categories is equal and opposite to the 'no exit' probability. That is, the difference in the probability of not exiting for each group, say Musculoskeletal, relative to the omitted group is equal to the sum of the probability of exiting by all means for the Musculoskeletal relative to those with a mental disorder.

Again, recipients with mental disorder are less likely to exit from benefits due to excess income/assets. As for the exit due to death, only circulatory and other disability category are statistically significant. The MNL estimates for disability are not statistically significant for the disqualified exit type except for people with other disabilities.

The probability of exit increases with age at entry - mostly to the 'other exit' category. The increase is dramatic for the oldest two groups. For instance, as compared to those 18-24, those in the age groups 25-34, 35-44, and 45-54 are 4 or 5 percentage points more likely to exit whereas those 55-64 and 65 and older are some 24 to 30 percentage points more likely to exit. The significantly higher exit probabilities of those 55 and older may be associated with eligibility for Canada Pension Plan Disability benefits, private pension benefits and, after 65, for Old Age Security benefits.

The exit probabilities vary somewhat with level of education but, with other things held constant, the differences appear to be small.

Point estimates for family structure and marital status imply that singles are more likely to exit than couples. Putting this into perspective, if those never married were married or living common law their probability of staying on benefits would be 6 percentage points lower. Among singles and couples, parents (single

mothers and singles fathers) are more likely to stay on benefits. For instance, the probability of exiting to 'other exit' is 2 percentage points less for singles and couples with children than for singles and couples without children. This implies that the presence of children reduces the probability of exit from benefits.

In contrast to the unconditional exit rates presented in Table 1.4, immigrants are more likely, by 3 percentage points, to stay on benefits and less likely to exit to any of the exit categories than Canadians at birth.

Homeowners are 8 percentage points less likely to stay on benefits, and more likely to exit to 'other exit', as compared to renters, but there is little difference among the other accommodation types.

Finally, males are more likely to exit and less likely to stay on benefits than females, but the differences are slight.

Overall, we find that the MNL estimates provide some insight into the types of exits. The key results are that recipients are more likely to stay on benefits if they have mental disorders, are younger, less educated, single, and couples with or without children as compared to other groups. The estimates are generally in line with the unconditional exit rates presented in Table 1.4 except for immigration status.

1.5 Duration Dependence

The previous section assesses the likelihood of at least one exit within five years of first entry for the 2004 through 2009 entry cohorts. A natural next step is to investigate whether the behaviour of the first-time entrants differs from that of the recipients with some benefit history. Kapteyn et al. (2008), Galarneau and Radulescu (2009) and Oguzoglu (2010) find that disability benefit recipients are likely to remain on benefits (less likely to return-to-work) even after their recovery from disability. Economic theory predicts that, given recipient characteristics, longer periods of support result in depreciation of human capital and hence in increased dependence on support (in this case, disability benefits). Also, participation in support programs may represent a stigma -- a bad signal to employers -- that results in increased difficulty in getting and

holding jobs. It may also lead to changes in family composition, lower marriage rates, higher divorce rates, and larger family sizes, all of which might result in higher demand for and longer duration of spells in support programs.

We can identify the first-time entrants and recipients with some benefit history based on the available information on the number of months of benefits (months-on-assistance) at entry into benefits in a calendar year. For example, a first-time entrant is a recipient who starts a benefit spell in a calendar year, say 2004, and was not in receipt of benefits in any of the preceding calendar years. To investigate the impact of the history of benefit receipt on the likelihood of exit from benefits, we classify recipients into six groups; Zero, 2-12, 13-24, 25-36, 37-48, and >48 months of benefits receipt in any of the preceding calendar years.

We employ logistic regression to estimate the effect of recipient characteristics, especially benefit receipt history, on the probability of exit from benefits. To this end, we use two distinct samples; the 2004 caseload sample and the 2004 to 2009 entry cohorts sample consistent with the analysis presented in earlier sections.[18] The caseload sample includes all those in receipt of benefits at the end of 2004; we make use of the application date to determine the number of benefit months in earlier years. (These recipients could include some who have been on disability benefits since the inception of ODSP in 1997 or even earlier, from its predecessor program). The entry cohort sample includes recipients who commenced a spell in the 2004 or 2004 to 2009 calendar years. We observe the benefit receipt behaviour of the caseload and the entry cohort samples for five calendar years.

The results in Table 1.7 are odds ratios. The odds ratio is a measure of association that gives the effect of the explanatory variables (history of benefit receipt given recipient characteristics) on the outcome variable (likelihood of exiting from benefits) relative to the likelihood of the base outcome. An odds ratio > 1 (< 1) implies higher (lower) likelihood of exit from benefits relative to base category. If longer periods on benefits

[18] We have estimated logistic regression models for each year, from 2004 to 2009, caseload and entry cohort samples. However, estimates for the 2004 caseload, the 2004 and 2004 to 2009 entry cohorts are reported.

result in lower odds of exit, recipients with fewer benefit months would exhibit higher odds of exit from benefits than those with more benefit months.

The results are as expected and in line with the results reported in previous sections. They are also generally consistent with the notion that longer periods of support result in lower odds of exit from disability benefits: the likelihood of exit decreases as the number of benefit months increases. For instance, for the 2004 entry cohort model, the odds of exit from disability benefits at any time during next five years for recipients with 2-12 benefit months is about 0.8 times smaller than for first-time entrants with zero benefit months. From the 2004 caseload model, the impact is about 0.4.

1.6 Conclusions and Policy Implications

Using administrative data files, we have analysed the dynamics of disability support receipt in Ontario from 2003 to 2013 in three steps, focusing on the dynamics of benefit receipt, exit, and the type and nature of exit. The first is purely descriptive: it provides insights into trends in the aggregate caseload and the inflows and outflows associated with that caseload. The second focuses on differences in exit behaviour across groups defined by demographic and contextual characteristics in a spell based-perspective of the transition out of ODSP. Multinomial regression analysis is carried out to investigate the determinants of the type and nature of exits. Finally, logit regression is employed to investigate the impact of the history of benefit receipt.

Consistent with the perception that exit from disability benefits is not very common, we find that only about 18 percent of benefit recipients exited within five years of their first spell, most of them within one and half years. However, about 38 percent who did exit were back on benefits within the five years. Although the exit rate is low, we find clear associations between the characteristics of benefit recipients and their probabilities of exit.

Individuals with a mental disorder account for about 50 percent of the total caseload; this group has the highest entry rate, the lowest exit rate, and the highest rate of return after a first non-death exit. Generally,

benefit receipt and entry rates increase with age, as does the probability of exit. Education has the opposite relationship: the benefit receipt and entry rates decrease with level of education while the exit rates increase. Immigrants are less likely to enter and less likely to exit; that is, immigrants have lower entry rates and lower exit rates than the Canadian-born. However, the benefit receipt rates among immigrants grew much faster than among the Canadian-born between 2003 and 2013 The low entry rates could be partially attributed to the "healthy immigrant effect" and the low exit rates to a lower probability of finding employment and/or eligibility for and expected income from alternative benefit programs such as the Canada Pension Plan, Old Age Security, and the Guaranteed Income Supplement. Being single is associated with a higher entry rate, a higher benefit receipt rate, and a higher probability of exit. The presence of children and a history of benefit receipt reduces the likelihood of exit.

ODSP benefit recipients are heterogeneous and while only about 18 percent exited within five years of their first spell, the analysis helps to identify groups of recipients who might benefit from various policy interventions. For instance, singles without mental illness, with their relatively high probabilities of exit, may be suitable targets for employment support programs. While perhaps not causal, since more education is generally associated with higher probabilities of exit, education or retraining programs may be useful for this subgroup. It is also likely that singles have less by way of support networks than couples, in which case offering them labor market-oriented support services might help them to cross the labour market entry threshold. Finally, since older immigrants are less likely to exit (as shown in Chapter 3) we speculate that measures designed to improve their integration into the labour market could help to reduce benefit dependence.

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Table 1.1: ODSP Annual Entries and Exits and Year End Caseload by Sex, All Spells of Recipients 18 and Older

Years	Male			Female			Both Sexes		
	Entries	Exits	Caseload	Entries	Exits	Caseload	Entries	Exits	Caseload
Panel A: Annual Entries and Exits and Year End Caseload									
2003	10,500	8,336	104,950	9,860	7,725	96,019	20,360	16,061	200,969
2004	11,989	9,309	107,630	11,488	8,807	98,700	23,477	18,116	206,330
2005	12,567	9,283	110,914	11,902	8,991	101,611	24,469	18,274	212,525
2006	14,792	9,487	116,219	14,191	8,898	106,904	28,983	18,385	223,123
2007	15,606	8,939	122,886	14,741	8,477	113,168	30,347	17,416	236,054
2008	15,291	9,445	128,732	14,280	8,823	118,625	29,571	18,268	247,357
2009	17,225	9,641	136,316	15,542	9,059	125,108	32,767	18,700	261,424
2010	17,337	9,819	143,834	15,339	9,355	131,092	32,676	19,174	274,926
2011	17,527	10,173	151,188	15,399	9,661	136,830	32,926	19,834	288,018
2012	18,106	11,535	157,766	16,017	10,759	142,083	34,123	22,294	299,847
2013	18,054	12,000	163,810	15,572	11,236	146,427	33,626	23,236	310,237
Panel B: Entry, Exit and Benefit Receipt Rates									
2003	23	7.9	227	20	8.0	199	22	8.0	213
2004	26	8.6	229	23	8.9	201	24	8.8	215
2005	26	8.4	233	24	8.8	204	25	8.6	218
2006	31	8.2	241	28	8.3	212	29	8.2	226
2007	32	7.3	252	29	7.5	221	30	7.4	236
2008	31	7.3	261	27	7.4	228	29	7.4	244
2009	35	7.1	274	29	7.2	237	32	7.2	255
2010	34	6.8	285	29	7.1	245	31	7.0	265
2011	34	6.7	296	28	7.1	252	31	6.9	274
2012	35	7.3	304	29	7.6	258	32	7.4	280
2013	34	7.3	311	28	7.7	262	31	7.5	286

NOTES: Entry - entered benefits during calendar year. Exit - out of benefits for at least two consecutive months in the calendar year. Caseload - on benefits as of December 01 of calendar year. Benefit and Entry Rate - per 10,000 population. Exit Rate - share (%) of year end caseload. Entries and exit are based on two months rule - absent from benefit for at least two months

Table 1.2: Benefit Receipt Rates Per 10,000 Population 18 and Older by Recipient Characteristics, 2003 and 2013

Characteristic	Male			Female			Both Sexes		
	2003	2013	Avg. Annual Change (%)	2003	2013	Avg. Annual Change (%)	2003	2013	Avg. Annual Change (%)
Panel A: Per 10, 000 of Population									
Disability Type									
Mental Disorder	109	166	4.4	92	135	4.0	100	150	4.2
Musculoskeletal	26	33	2.2	30	36	1.8	28	35	2.0
Nervous and Sense Organ	22	26	1.6	19	22	1.8	21	24	1.7
Circulatory	14	16	1.1	10	9	-0.8	12	12	0.3
Other	56	70	2.3	48	59	2.1	52	64	2.2
Exit Type									
No Exit	225	309	3.2	197	261	2.8	211	284	3.0
Died	0.12	0.08	-4.0	0.05	0.06	1.8	0.08	0.07	-1.8
Excess Income/Asset	0.12	0.04	-10.2	0.10	0.03	-11.2	0.11	0.04	-10.6
Disqualified	0.07	0.05	-2.6	0.07	0.02	-13.7	0.07	0.03	-6.9
Other	1.65	1.73	0.5	1.32	1.55	1.7	1.48	1.64	1.0
Accommodation									
Rented	129	201	4.5	111	168	4.2	120	184	4.4
Subsidized Housing	30	30	0.3	38	42	0.8	34	36	0.6
Owned	15	17	1.8	13	17	2.5	14	17	2.1
Other	54	62	1.4	36	36	0.0	45	49	0.8
Total Benefit Receipt Rate	227	311	3.2	199	262	2.8	213	286	3.0
Panel B: Per 10, 000 of Group Specific Population									
Age Group									
18 - 24	117	199	5.5	88	130	4.0	102	165	4.9
25 - 34	175	292	5.3	138	214	4.5	157	252	4.9
35 - 44	252	324	2.5	211	285	3.1	232	304	2.8
45 - 54	326	438	3.0	297	407	3.2	311	423	3.1
55 - 64	370	512	3.3	399	479	1.9	384	495	2.6
65+	98	70	-3.4	77	57	-2.9	86	63	-3.1
Education									
0 - 8	1483	1103	-2.9	1092	799	-3.1	1267	934	-3.0
9 - 11	332	799	9.2	303	660	8.1	318	731	8.7
12 - 13	211	435	7.5	170	374	8.2	189	404	7.9
Post Secondary	39	87	8.5	40	93	8.8	39	90	8.7
Family Structure									
Couples without Children	109	98	-1.0	55	71	2.6	163	169	0.3
Couples with Children	53	67	2.5	22	40	6.1	75	108	3.7
Singles without Children	251	296	1.7	225	232	0.3	476	528	1.1
Singles with Children	38	62	4.9	234	430	6.3	272	491	6.1
Marital Status									
Never Married	480	669	3.4	389	507	2.7	439	594	3.1
Divorced, Separated, Widowed	498	657	2.8	487	563	1.5	491	595	1.9
Common Law, Married	76	85	1.2	37	60	5.0	56	72	2.5
Immigration Status									
Canadians at Birth	277	369	2.9	240	310	2.6	258	339	2.7
Immigrants	128	198	4.5	120	179	4.1	124	188	4.3
Caseload	104,950	163,810		96,019	146,427		200,969	310,237	

NOTES: Benefit Receipt - Number of individuals on benefits in December of each year. All characteristics are as of date of entry.

Table 1.3: Entry Rates Per 10,000 Population 18 and Older by Recipient Characteristics, 2004 and 2013 Entry Cohorts (First Spell Only)

Characteristic	Male			Female			Both Sexes		
	2004	2013	Avg. Annual Change (%)	2004	2013	Avg. Annual Change (%)	2004	2013	Avg. Annual Change (%)
Panel A: By Population									
Disability Type									
Mental Disorder	8.7	14.6	6.0	8.2	11.5	3.7	8.4	13.0	4.9
Musculoskeletal	2.3	3.2	4.0	2.9	3.5	1.9	2.6	3.3	2.8
Nervous and Sense Organ	1.5	2.1	3.5	1.3	1.6	2.3	1.4	1.8	2.9
Circulatory	1.7	1.9	1.2	1.1	1.0	-1.1	1.4	1.4	0.3
Other	7.8	7.6	-0.3	7.0	6.3	-1.2	7.4	6.9	-0.7
Accommodation									
Rented	13.4	19.8	4.4	12.5	16.0	2.8	12.9	17.8	3.6
Subsidised Housing	1.6	1.3	-2.1	3.2	2.6	-2.4	2.4	2.0	-2.2
Owned	1.3	1.9	4.4	1.5	2.0	3.3	1.4	1.9	3.8
Other	5.6	6.3	1.4	3.5	3.3	-0.5	4.5	4.8	0.7
Total Entry Rate	21.9	29.4	3.3	20.6	23.8	1.6	21.2	26.5	2.5
Panel B: By Group Specific Population									
Age Group									
18 - 24	32.2	50.3	5.1	23.7	32.6	3.6	28.1	41.6	4.5
25 - 34	16.6	24.7	4.5	14.9	21.3	4.1	15.7	23.0	4.3
35 - 44	20.5	25.9	2.6	21.5	25.3	1.8	21.0	25.6	2.2
45 - 54	26.3	35.1	3.3	27.3	32.4	1.9	26.8	33.7	2.6
55 - 64	28.7	38.3	3.3	31.1	31.8	0.3	29.9	35.0	1.8
65+	9.6	6.9	-3.6	8.7	5.6	-4.8	9.1	6.1	-4.2
Education									
0 - 8	53.1	60.6	1.5	47.8	48.7	0.2	50.1	54.0	0.8
9 - 11	45.9	77.6	6.0	43.5	56.2	2.9	44.7	67.2	4.6
12 - 13	31.6	44.8	4.0	26.4	36.2	3.5	28.9	40.4	3.8
Post Secondary	7.1	9.7	3.6	7.4	10.4	3.9	7.2	10.1	3.8
Family Structure									
Couples without Children	2.0	2.0	0.0	2.5	3.1	2.7	7.1	7.5	0.6
Couples with Children	3.7	4.2	1.5	1.6	2.3	4.1	5.8	6.9	2.0
Singles without Children	49.0	66.8	3.5	49.1	53.7	1.0	49.0	60.6	2.4
Singles with Children	32.5	42.3	3.0	45.4	56.0	2.4	43.5	53.8	2.4
Marital Structure									
Never Married	40.7	59.4	4.3	31.7	43.4	3.5	36.6	52.0	4.0
Divorced, Separated, Widowed	65.3	71.7	1.1	58.9	53.2	-1.1	61.0	59.5	-0.3
Common Law, Married	7.0	8.0	1.5	4.0	5.7	3.9	5.5	6.9	2.4
Immigration Status									
Canadians at Birth	25.5	35.5	3.8	22.6	27.7	2.3	24.0	31.5	3.1
Immigrants	20.2	24.5	2.2	19.7	21.1	0.8	19.9	22.7	1.4
Total Entries	10,281	15,480		10,111	13,301		20,392	28,781	

NOTES: First Entry - not in receipt of benefits in preceding calendar year.

Table 1.4: Nature of First Exit, if any, by Recipient Characteristics, 2004 and 2009 Entry Cohorts, Both Sexes

Characteristic	2004 Entry Cohort					2009 Entry Cohort				
	Entries	Nature of First Exit (%)			Returned after First Non-death Exit	Entries	Nature of First Exit (%)			Returned after First Non-death Exit
		No Exit	Died and Disqualified	Other Exit			No Exit	Died and Disqualifie	Other Exit	
Disability Type										
Mental Disorder	8,110	88.5	2.2	9.4	68.1	12,380	87.5	2.1	10.4	56.2
Musculoskeletal	2,496	77.9	2.8	19.3	36.7	3,990	78.6	2.6	18.8	32.4
Nerves and Sense Organ	1,365	83.5	3.0	13.5	47.2	1,934	82.9	2.6	14.5	45.0
Circulatory	1,339	65.6	5.2	29.2	26.9	1,847	67.0	3.8	29.2	23.7
Other	7,082	68.1	6.0	26.0	29.7	8,497	68.8	4.9	26.3	27.9
Age Group										
18-24	3,325	92.5	1.7	5.9	78.1	4,823	92.5	1.6	5.9	62.3
25-34	2,683	87.2	3.2	9.7	67.7	3,968	86.8	2.4	10.7	58.2
35-44	4,331	86.2	3.3	10.4	65.9	5,282	85.5	2.7	11.8	54.0
45-54	4,826	81.4	4.6	14.0	54.8	7,543	82.4	3.5	14.1	49.4
55-64	3,796	58.4	5.3	36.4	25.2	5,734	58.8	4.6	36.6	23.3
65plus	1,431	46.4	5.1	48.5	8.9	1,298	49.5	4.2	46.3	8.8
Education										
0 - 8	3,686	70.0	4.1	25.9	31.2	3,589	71.9	3.2	24.8	20.9
9 -11	6,766	82.5	3.4	14.1	43.4	9,540	83.3	2.9	13.8	41.2
12 - 13	5,875	80.2	4.0	15.9	43.9	9,118	80.0	3.3	16.7	40.7
Post Sec	4,065	75.9	4.0	20.1	38.8	6,401	75.5	3.2	21.3	37.2
Family Structure										
Couples without Children	1,763	66.9	3.0	30.1	33.0	2,394	66.7	3.4	29.9	37.4
Couples with Children	1,435	82.0	2.7	15.3	48.3	2,049	82.7	2.3	14.9	60.7
Singles without Children	14,795	77.8	4.2	18.0	39.1	20,970	78.9	3.3	17.8	33.8
Singles with Children	2,399	87.0	2.7	10.3	47.6	3,235	86.9	2.5	10.5	41.3
Marital Status										
Never Married	8,533	86.1	3.0	10.9	52.9	12,660	86.0	2.6	11.4	42.7
Divorced, Separated, Widowe	8,613	72.8	4.8	22.5	33.3	11,319	74.0	3.6	22.4	30.4
Com Law, Married	3,246	72.3	3.3	24.4	38.0	4,669	72.5	3.6	23.9	41.8
Immigration Status										
Canadians at Birth	14,223	81.0	4.0	15.0	50.3	20,272	81.1	3.1	15.8	43.6
Immigrants	6,169	71.8	3.5	24.7	23.4	8,376	74.2	3.2	22.6	24.1
Accommodation										
Rented	12,414	77.8	3.7	18.5	35.8	18,932	78.9	3.3	17.8	34.0
Subsidized Housing	2,328	79.4	3.3	17.3	40.5	2,512	78.0	3.2	18.8	35.5
Owned	1,321	63.9	5.2	30.9	40.8	2,182	65.4	3.2	31.4	39.4
Other	4,329	83.4	3.9	12.7	51.9	5,022	86.4	2.5	11.1	48.8
Total	20,392	78.3	3.8	17.9	39.4	28,648	79.1	3.2	17.8	36.5

NOTES: New Entry - not in receipt of benefits in preceding calendar year. Entry Cohort - Entered during a calendar year. Observation period - 5 years, 2004 to 2008 and 2009 to 2013. Disqualified - due to excess Income/Asset and other administrative reasons

Table 1.5: Nature of First Exit within Five Years, if any, by Entry Cohorts and Sex

Entry Year	Entries	Nature of First Exit (%)					Returned after First Non-death Exit
		No Exit	Died	Excess Income/Assets	Disqualified	Other Exit	
Panel A: Male							
2004	10,281	78.4	2.4	0.7	1.1	17.4	41.4
2005	10,844	78.7	2.4	0.9	0.9	17.0	42.2
2006	12,822	80.4	2.1	0.7	0.8	15.9	43.0
2007	13,687	79.2	1.9	0.8	0.8	17.2	40.5
2008	13,238	80.0	1.9	0.6	0.8	16.7	40.7
2009	15,015	78.9	1.8	0.6	0.9	17.9	36.3
Panel B: Female							
2004	10,111	78.1	1.5	1.0	0.9	18.4	37.5
2005	10,395	79.6	1.6	0.9	1.0	17.0	39.4
2006	12,534	81.2	1.3	0.9	0.8	15.9	41.0
2007	13,092	80.9	1.2	0.8	0.8	16.3	37.4
2008	12,589	81.0	1.4	0.7	0.7	16.2	42.9
2009	13,633	79.3	1.2	0.9	0.9	17.7	36.7
Panel C: Both Sexes							
2004	20,392	78.3	2.0	0.9	1.0	17.9	39.4
2005	21,239	79.1	2.0	0.9	1.0	17.0	40.8
2006	25,356	80.8	1.7	0.8	0.8	15.9	42.0
2007	26,779	80.0	1.6	0.8	0.8	16.8	39.0
2008	25,827	80.5	1.7	0.7	0.8	16.4	41.8
2009	28,648	79.1	1.5	0.7	0.9	17.8	36.5

Table 1.6: Multinomial Logit Estimates - The Mean Marginal Effects of Recipient Characteristics on the Probability of Exit, Both Sexes, (2004 to 2009 Entry Cohorts)

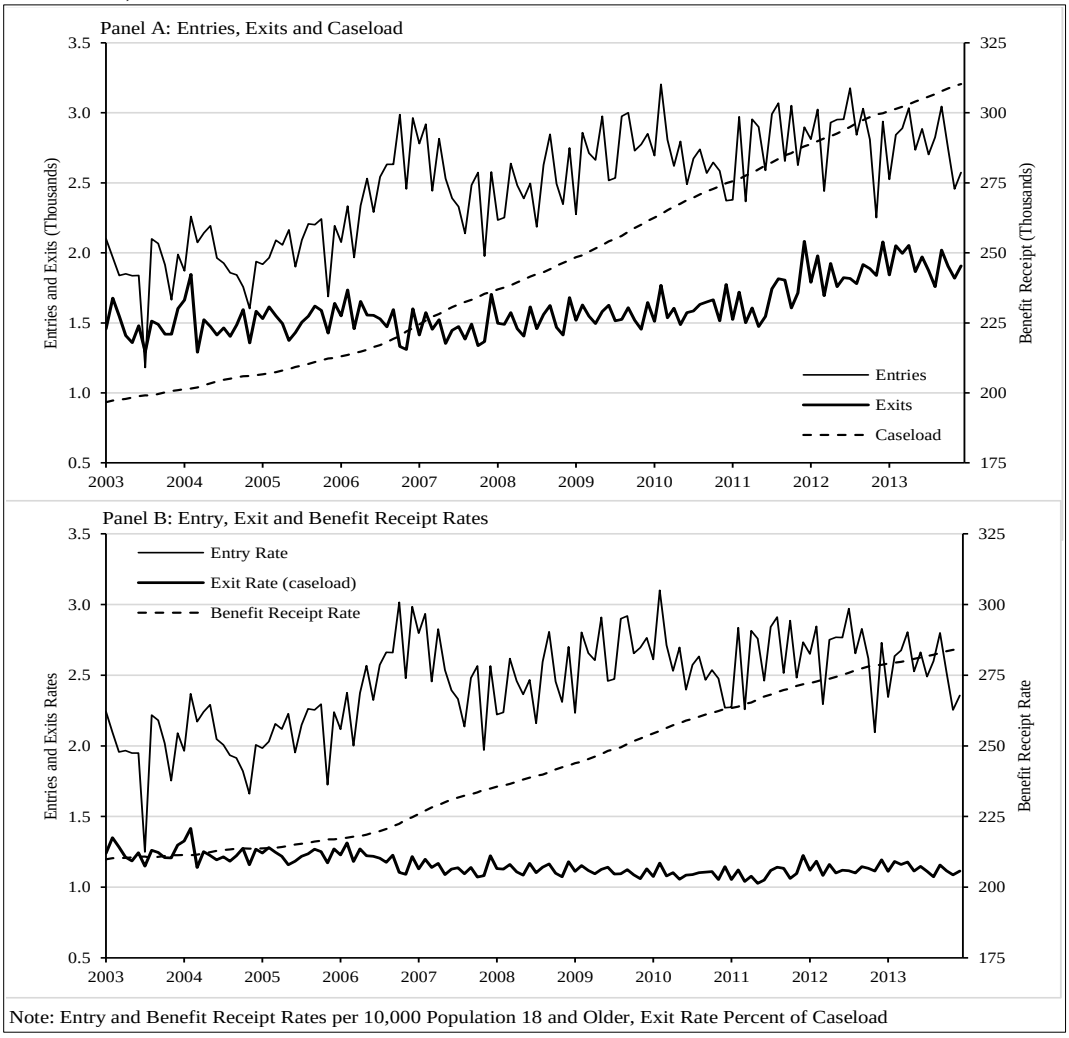
Explanatory Variables	No Exit		Died		Excess Income/Assets		Disqualified		Other	
	Effect	S.E	Effect	S.E	Effect	S.E	Effect	S.E	Effect	S.E
Disability Type (Mental Disorder)										
Musculoskeletal	-0.0310***	0.0029	-0.0010	0.0006	0.0030***	0.0007	-0.0008	0.0007	0.0298***	0.0027
Nerves and Sense Organ	-0.0383***	0.0042	0.0025*	0.0011	0.0035***	0.0010	-0.0010	0.0009	0.0333***	0.0039
Circulatory	-0.0759***	0.0042	0.0092***	0.0012	0.0022**	0.0008	-0.0003	0.0010	0.0648***	0.0038
Other	-0.1030***	0.0026	0.0172***	0.0008	0.0013**	0.0005	0.0035***	0.0006	0.0806***	0.0024
Age Group (18 - 24)										
25 - 34	-0.0517***	0.0032	0.0040***	0.0006	0.0028***	0.0007	0.0031**	0.0010	0.0417***	0.0030
35 - 44	-0.0577***	0.0031	0.0084***	0.0007	0.0017**	0.0006	0.0023*	0.0010	0.0453***	0.0028
45 - 54	-0.0668***	0.0030	0.0159***	0.0008	0.0018**	0.0006	-0.0010	0.0009	0.0502***	0.0027
55 - 64	-0.2760***	0.0043	0.0220***	0.0011	0.0083***	0.0009	-0.0008	0.0009	0.2470***	0.0041
65+	-0.3360***	0.0074	0.0072***	0.0012	0.0276***	0.0030	0.0004	0.0013	0.3010***	0.0072
Education (0 - 8)										
9 - 11	0.0117***	0.0029	0.0024***	0.0007	-0.0007	0.0005	0.0008	0.0008	-0.0141***	0.0027
12 - 13	-0.00143	0.0030	0.0020**	0.0007	0.0012*	0.0006	-0.0010	0.0008	-0.0007	0.0027
Post Secondary	-0.0197***	0.0032	0.0019*	0.0008	0.0027***	0.0006	-0.0016*	0.0008	0.0168***	0.0029
Marital Status (Never Married)										
Divorced, Separated, Widowed	-0.0240***	0.0025	-0.0009	0.0006	0.0014*	0.0005	0.0020***	0.0005	0.0216***	0.0024
Common Law, Married	-0.0615***	0.0072	-0.0041**	0.0015	0.0012	0.0013	0.0321***	0.0033	0.0322***	0.0063
Family Structure (Couples without Children)										
Couples with Children	0.0199***	0.0042	0.0018	0.0011	0.0014	0.0010	-0.0008*	0.0003	-0.0223***	0.0039
Singles without Children	-0.0362***	0.0061	0.0064***	0.0014	-0.0003	0.0013	0.0082***	0.0005	0.0219***	0.0058
Singles with Children	0.0182**	0.0065	0.0010	0.0014	-0.0016	0.0014	0.0067***	0.0009	-0.0243***	0.0061
Immigration Status (Canadians at Birth)										
Immigrants	0.0256***	0.0022	-0.0033***	0.0005	-0.0029***	0.0004	-0.0017**	0.0005	-0.0177***	0.0020
Accommodation (Rented)										
Subsidized Housing	0.00503	0.0031	-0.0027***	0.0007	-0.0001	0.0006	-0.0013	0.0008	-0.0010	0.0029
Owned	-0.0752***	0.0044	-0.0013	0.0009	0.0081***	0.0011	-0.0013	0.0009	0.0697***	0.0041
Other	-0.0098**	0.0032	0.0022**	0.0008	0.0005	0.0006	-0.0003	0.0007	0.0075*	0.0030
Sex (Female)										
Male	-0.0096***	0.0020	0.0044***	0.0005	-0.0009*	0.0004	0.0005	0.0005	0.0056**	0.0019

N = 148241, Mean Marginal Effects, * p<0.05, ** p<0.01, *** p<0.00, Estimates for entry years are not shown

Table 1.7: Logistic Regression Estimates – The Effect of Benefit Recipient Characteristics on the Probability of Exit within the Follow-up Period of Five Years

Explanatory Variables	2004 Caseload		2004 Entry Cohort		2004-2009 Entry Cohorts	
	Odds Ratios	S.E	Odds Ratios	S.E	Odds Ratios	S.E
Months on Benefits (Zero)						
2-12	0.366***	0.036	0.791***	0.034	0.809***	0.016
13-24	0.081***	0.007	0.653***	0.031	0.786***	0.015
25-36	0.011***	0.001	0.528***	0.037	0.509***	0.014
37-48	0.006***	0.001	0.506***	0.082	0.394***	0.014
>48	0.004***	0.000	1.388	0.409	0.302***	0.015
Disability Type (Mental Disorder)						
Musculoskeletal	1.645***	0.037	1.254***	0.071	1.290***	0.014
Nerves and Sense Organ	1.287***	0.039	1.236**	0.082	1.164***	0.016
Circulatory	1.677***	0.047	1.798***	0.131	1.459***	0.019
Other	1.705***	0.030	1.829***	0.072	1.178***	0.011
Age Group (18 - 24)						
25 - 34	1.609***	0.050	1.577***	0.101	1.429***	0.034
35 - 44	1.733***	0.054	1.516***	0.096	1.486***	0.034
45 - 54	1.527***	0.047	1.654***	0.108	1.532***	0.034
55 - 64	3.977***	0.125	4.560***	0.963	2.179***	0.050
65+	4.858***	0.121	6.710***	1.124	7.080***	0.628
Education (0 - 8)						
9 - 11	0.793***	0.018	0.980	0.050	1.076***	0.010
12 - 13	0.779***	0.017	1.110*	0.057	1.131***	0.011
Post Secondary	0.851***	0.019	1.376***	0.076	1.239***	0.012
Marital Status (Never Married)						
Divorced, Separated, Widowed	1.311***	0.024	1.274***	0.055	1.336***	0.012
Common Law, Married	1.593***	0.068	1.596***	0.225	1.828***	0.043
Family Structure (Couples without Children)						
Couples with Children	0.809***	0.028	0.799**	0.069	0.979	0.030
Singles without Children	1.180***	0.053	1.230	0.178	1.821***	0.043
Singles with Children	0.9310	0.046	0.869	0.132	1.063	0.039
Accommodation (Rented)						
Subsidized Housing	0.871***	0.014	0.860***	0.034	1.108***	0.010
Owned	1.368***	0.033	0.883*	0.048	1.146***	0.012
Other	1.115***	0.026	1.045	0.051	1.616***	0.019
Immigration Status (Canadians at Birth)						
Immigrants	0.746***	0.027	0.776***	0.014	0.428***	0.004
Sex (Females)						
Males	1.001	0.015	1.044	0.036	1.082***	0.014
N	206330		20384		148241	

Figure 1.1: ODSP Monthly Entries, Exits and Caseload, Levels ('000s) and Rates (per 10,000 population 18 and older), 2003-2013



Note: Entry and Benefit Receipt Rates per 10,000 Population 18 and Older, Exit Rate Percent of Caseload

Appendix I

Table A1: Annual Entries and Exits and Year End Caseload by Sex (all Spells of Recipients 18 and Older), 2003-2013

Years	Male			Female			Both Sexes		
	Entries	Exits	Caseload	Entries	Exits	Caseload	Entries	Exits	Caseload
Panel A: Annual Entries and Exits and Year End Caseload									
2003	11,276	9,199	104,863	10,574	8,503	95,955	21,850	17,702	200,818
2004	13,019	10,353	107,529	12,411	9,736	98,630	25,430	20,089	206,159
2005	13,729	10,430	110,828	12,935	10,027	101,538	26,664	20,457	212,366
2006	16,063	10,777	116,114	15,324	10,041	106,821	31,387	20,818	222,935
2007	16,869	10,303	122,680	15,920	9,751	112,990	32,789	20,054	235,670
2008	17,014	11,072	128,622	15,703	10,167	118,526	32,717	21,239	247,148
2009	18,844	11,275	136,191	16,998	10,509	125,015	35,842	21,784	261,206
2010	19,094	11,583	143,702	16,954	10,997	130,972	36,048	22,580	274,674
2011	19,513	12,201	151,014	17,284	11,566	136,690	36,797	23,767	287,704
2012	20,523	14,127	157,410	18,142	13,055	141,777	38,665	27,182	299,187
2013	20,854	14,690	163,574	18,056	13,618	146,215	38,910	28,308	309,789
Panel B: Entry, Exit and Benefit Receipt Rates									
2003	24	8.8	227	22	8.9	199	23	8.8	213
2004	28	9.6	229	25	9.9	201	26	9.7	215
2005	29	9.4	233	26	9.9	204	27	9.6	218
2006	33	9.3	241	30	9.4	211	32	9.3	226
2007	35	8.4	252	31	8.6	221	33	8.5	236
2008	35	8.6	261	30	8.6	228	32	8.6	244
2009	38	8.3	273	32	8.4	237	35	8.3	255
2010	38	8.1	285	32	8.4	245	35	8.2	264
2011	38	8.1	295	32	8.5	252	35	8.3	273
2012	40	9.0	303	33	9.2	258	36	9.1	280
2013	40	9.0	310	32	9.3	262	36	9.1	285

NOTES: Entry - entered benefits during calendar year. Exit - out of benefits for at least one month in the calendar year. Caseload - on benefits as of December 01 of calendar year (same as ministry but duplicates removed). Benefit and Entry Rate - per 10,000 population. Exit Rate - share (%) of year end caseload. Entries and exit are based on one months rule - absent from benefit for at least one months

Table A2: Benefit Receipt by Recipient Characteristics, 2003 and 2013 (percent)

Characteristic	Male			Female			Both Sexes		
	2003	2013	Avg. Annual Change (%)	2003	2013	Avg. Annual Change (%)	2003	2013	Avg. Annual Change (%)
Disability Type									
Mental Disorder	48	54	1.1	46	52	1.1	47	53	1.1
Musculoskeletal	12	11	-1.0	15	14	-1.0	13	12	-1.0
Nervous and Sense Organ	10	8	-1.6	9	9	-1.0	10	8	-1.3
Circulatory	6	5	-2.0	5	4	-3.5	6	4	-2.6
Other	25	22	-0.9	24	22	-0.7	24	22	-0.8
Exit Type									
No Exit	99.1	99.4	0.0	99.2	99.4	0.0	99.2	99.4	0.0
Died	0.05	0.03	-3.9	0.03	0.02	0.8	0.04	0.02	-3.9
Excess Income/Asset	0.05	0.01	-9.0	0.05	0.01	-9.8	0.05	0.01	-9.0
Disqualified	0.03	0.02	-2.7	0.04	0.01	-6.6	0.03	0.01	-2.7
Other	0.73	0.56	-1.7	0.66	0.59	-0.8	0.70	0.57	-1.7
Accommodation									
Rented	57	65	1.3	56	64	1.3	56	64	1.3
Subsidized Housing	13	10	-2.8	19	16	-1.9	16	13	-2.3
Owned	6	6	-1.3	7	6	-0.3	7	6	-0.8
Other	24	20	-1.8	18	14	-2.7	21	17	-2.1
Age Group									
18 - 24	7	8	2.3	5	6	1.2	6	7	1.9
25 - 34	14	16	1.1	12	14	1.0	13	15	1.1
35 - 44	25	18	-3.4	23	18	-2.2	24	18	-2.8
45 - 54	27	28	0.4	27	29	0.7	27	29	0.5
55 - 64	21	26	2.3	26	29	1.2	23	28	1.7
65+	6	4	-4.4	7	4	-4.4	7	4	-4.4
Education									
0 - 8	46	17	-9.5	46	17	-9.3	46	17	-9.4
9 - 11	25	34	3.4	24	30	2.5	24	32	3.0
12 - 13	19	32	5.5	19	31	5.0	19	31	5.2
Post Secondary	10	17	5.9	11	22	7.3	11	20	6.6
Family Structure									
Couples without Children	13	9	0.8	7	7	4.4	10	8	2.1
Couples with Children	8	7	3.0	4	5	6.7	6	6	4.3
Singles without Children	77	82	5.2	76	72	3.8	77	77	4.5
Singles with Children	2	2	5.0	13	16	6.4	7	9	6.2
Marital Status									
Never Married	58	60	0.4	42	44	0.5	50	52	0.5
Divorced, Separated, Widow	21	23	0.8	47	43	-0.9	34	33	-0.3
Common Law, Married	21	17	-2.2	11	13	1.7	16	15	-0.8
Immigration Status									
Canadians at Birth	81	78	-0.4	79	75	-0.5	80	77	-0.4
Immigrants	19	22	1.5	21	25	1.8	20	23	1.7
Caseload	104950	163810		96019	146427		200969	310237	

NOTES: Benefit Receipt - Number of individuals on benefits in December of each year. All characteristics are as of date of entry.

Table A3: Entries (percent) by Recipient Characteristics, 2004 and 2013 Entry Cohorts (First Entry Only)

Characteristic	Male			Female			Both Sexes		
	2004	2013	Avg. Annual Change (%)	2004	2013	Avg. Annual Change (%)	2004	2013	Avg. Annual Change (%)
Disability Type									
Mental Disorder	39.5	49.8	2.7	40.0	48.1	2.1	39.8	49.0	2.4
Musculoskeletal	10.3	10.9	1.0	14.2	14.6	0.5	12.2	12.6	0.6
Nervous and Sense Organ	6.9	7.0	0.3	6.5	6.9	0.7	6.7	6.9	0.5
Circulatory	7.8	6.5	-1.8	5.3	4.2	-2.4	6.6	5.4	-2.0
Other	35.6	25.8	-3.4	33.9	26.3	-2.8	34.7	26.0	-3.1
Accommodation									
Rented	61.2	67.4	1.1	60.5	67.1	1.2	60.9	67.2	1.1
Subsidized Housing	7.4	4.6	-5.1	15.5	10.8	-3.8	11.4	7.5	-4.5
Owned	5.9	6.5	1.2	7.1	8.2	1.8	6.5	7.3	1.4
Other	25.5	21.5	-1.7	16.9	14.0	-1.9	21.2	18.0	-1.6
Age Group									
18 - 24	19.0	22.1	1.9	13.6	16.1	2.1	16.3	19.3	2.1
25 - 34	13.8	14.2	0.4	12.6	14.8	1.9	13.2	14.5	1.1
35 - 44	20.7	14.9	-3.5	21.8	17.6	-2.3	21.2	16.2	-3.0
45 - 54	22.8	23.7	0.5	24.5	25.5	0.5	23.7	24.6	0.5
55 - 64	17.4	20.9	2.1	19.8	21.1	0.8	18.6	21.0	1.4
65+	6.4	4.1	-4.4	7.7	4.8	-4.5	7.0	4.4	-4.6
Education									
0 - 8	16.7	9.7	-5.8	19.5	11.3	-5.9	18.1	10.4	-5.9
9 - 11	34.6	35.3	0.2	31.7	28.2	-1.3	33.2	32.0	-0.4
12 - 13	29.4	34.4	1.8	28.3	32.8	1.7	28.8	33.7	1.8
Post Secondary	19.3	20.6	0.7	20.6	27.7	3.4	19.9	23.9	2.1
Family Structure									
Couples without Children	11.2	8.2	-3.4	6.0	6.8	1.7	8.6	7.5	-1.4
Couples with Children	8.9	7.9	-1.2	5.1	5.8	1.5	7.0	6.9	-0.1
Singles without Children	77.3	81.5	0.6	67.7	67.6	0.0	72.6	75.1	0.4
Singles with Children	2.6	2.4	-0.7	21.1	19.8	-0.7	11.8	10.4	-1.3
Marital Status									
Never Married	50.6	56.6	1.3	32.9	41.0	2.5	41.8	49.4	1.9
Divorced, Separated, Widowed	29.2	26.7	-1.0	55.4	45.2	-2.2	42.2	35.3	-2.0
Common Law, Married	20.1	16.7	-2.0	11.6	13.7	2.1	15.9	15.3	-0.4
Immigration Status									
Canadians at Birth	71.0	73.4	0.4	68.5	69.8	0.2	69.7	71.8	0.3
Immigrants	29.0	26.6	-0.9	31.5	30.2	-0.4	30.3	28.2	-0.7
Total Entries	10281	15480		10111	13301		20392	28781	

NOTES: First entry - not in receipt of benefit in preceding calendar year.

Table A4: Nature of First Exit, if any, by Recipient Characteristics, 2004 and 2009 Entry Cohorts, Males

Characteristic	2004 Entry Cohort					2009 Entry Cohort				
	Entries	Nature of First Exit (%)			Returned after First Non-death Exit	Entries	Nature of First Exit (%)			Returned after First Non-death Exit
		No Exit	Died and Disqualified	Other Exit			No Exit	Died and Disqualified	Other Exit	
Disability Type										
Mental Disorder	4062	88.5	2.6	8.8	76.8	6539	88.0	2.2	9.8	60.8
Musculoskeletal	1057	79.3	3.2	17.5	38.8	1840	78.1	2.8	19.1	32.3
Nerves, Sense Organs	706	81.9	3.1	15.0	40.8	976	83.6	2.3	14.1	46.7
Circulatory	800	66.8	4.4	28.9	25.1	1198	64.9	4.1	31.1	21.1
Other	3656	68.7	6.4	24.9	31.2	4462	68.5	5.0	26.4	27.0
Age Group										
18-24	1952	92.7	1.4	5.8	77.9	2895	92.7	1.5	5.8	70.8
25-34	1414	86.5	3.9	9.6	70.4	2059	87.9	2.3	9.8	67.1
35-44	2127	85.5	3.9	10.6	73.0	2687	85.2	3.0	11.8	54.3
45-54	2345	79.1	5.9	15.0	54.4	3819	80.2	4.1	15.7	43.4
55-64	1790	56.8	5.6	37.7	21.5	2979	58.0	4.9	37.1	21.7
65plus	653	51.3	4.4	44.3	11.4	576	46.4	3.5	50.2	9.4
Education										
0 - 8	1718	72.4	4.2	23.4	37.6	1712	70.9	3.4	25.8	20.7
9 -11	3560	82.2	4.0	13.7	44.7	5452	82.9	2.8	14.3	41.3
12 - 13	3018	79.4	4.2	16.3	42.6	4820	80.0	3.6	16.4	40.7
Post Sec	1985	75.1	4.4	20.5	39.4	3031	74.3	3.6	22.1	35.2
Family Structure										
Couples without Children	1156	64.2	3.0	32.8	24.0	1354	63.2	3.1	33.7	27.2
Couples with Children	915	81.2	2.7	16.1	40.9	1228	82.7	2.0	15.4	53.5
Singles without Children	7946	80.0	4.5	15.4	46.5	12069	80.1	3.4	16.5	36.5
Singles with Children	264	80.7	4.5	14.8	40.0	364	84.3	3.0	12.6	43.4
Marital Status										
Never Married	5203	85.3	3.5	11.2	56.0	7842	85.6	2.8	11.6	44.3
Divorced, Separated, Widowed	3007	71.6	6.1	22.3	37.9	4537	71.5	4.2	24.3	30.9
Com. Law, Married	2071	70.8	3.2	25.9	28.8	2636	71.4	3.0	25.6	34.0
Immigration Status			0.0					0.0		
Canadians at Birth	7296	80.5	4.6	14.9	50.8	10943	80.8	3.2	16.0	42.4
Immigrants	2985	73.1	3.4	23.5	25.8	4072	73.6	3.6	22.8	24.5
Accommodation										
Rented	6292	77.4	4.3	18.3	36.0	9932	78.1	3.5	18.3	32.3
Subsidized Housing	762	76.5	4.2	19.3	44.4	862	75.6	2.9	21.5	44.2
Owned	607	62.1	4.9	32.9	36.0	1050	63.9	3.2	32.9	35.9
Other	2620	85.0	3.9	11.1	62.8	3171	87.0	2.5	10.5	53.5
Total	10281	78.4	4.2	17.4	41.4	15015	78.9	3.3	17.9	36.3

NOTES: New Entry - not in receipt of benefits in preceding calendar year. Entry Cohort - Entered during a calendar year. Observation period - 5 years, 2004 to 2008 and 2009 to 2013. Disqualified - due to excess Income/Asset and other administrative reasons

Table A5: Nature of First Exit, if any, by Recipient Characteristics, 2004 and 2009 Entry Cohorts, Females

Characteristic	2004 Entry Cohort					2009 Entry Cohort				
	Entries	Nature of First Exit (%)			Returned after First Non-death Exit	Entries	Nature of First Exit (%)			Returned after First Non-death Exit
		No Exit	Died and Disqualified	Other Exit			No Exit	Died and Disqualified	Other Exit	
Disability Type										
Mental Disorder	4048	88.4	1.7	9.9	60.0	5841	86.9	2.1	11.0	51.7
Musculoskeletal	1439	76.9	2.4	20.6	35.4	2150	79.1	2.4	18.5	32.5
Nerves, Sense Organs	659	85.3	2.9	11.8	55.3	958	82.2	2.9	14.9	43.5
Circulatory	539	63.8	6.5	29.7	29.3	649	70.9	3.2	25.9	29.3
Other	3426	67.4	5.5	27.1	28.2	4035	69.1	4.7	26.2	29.0
Age Group										
18-24	1373	92.1	2.0	5.9	78.2	1928	92.3	1.8	6.0	50.7
25-34	1269	87.9	2.4	9.7	64.5	1909	85.7	2.6	11.7	50.4
35-44	2204	86.9	2.8	10.3	59.0	2595	85.9	2.5	11.7	53.7
45-54	2481	83.6	3.3	13.1	55.3	3724	84.6	3.0	12.4	57.1
55-64	2006	59.8	5.0	35.2	28.6	2755	59.6	4.4	36.1	25.0
65plus	778	42.3	5.7	52.1	7.1	722	51.9	4.8	43.2	8.3
Education										
0 - 8	1968	68.0	4.0	28.0	26.5	1877	72.9	3.1	24.0	21.2
9 -11	3206	82.8	2.8	14.4	42.0	4088	83.9	3.1	13.0	41.0
12 - 13	2857	81.0	3.7	15.4	45.4	4298	80.0	3.0	17.0	40.6
Post Sec	2080	76.6	3.6	19.8	38.3	3370	76.5	2.9	20.6	39.1
Family Structure										
Couples without Children	607	72.0	3.0	25.0	54.8	1040	71.3	3.8	24.9	54.7
Couples with Children	520	83.5	2.7	13.8	62.7	821	82.8	2.9	14.3	71.2
Singles without Children	6849	75.3	3.8	20.9	32.6	8901	77.4	3.1	19.5	30.7
Singles with Children	2135	87.8	2.4	9.7	49.0	2871	87.3	2.5	10.3	40.9
Marital Status										
Never Married	3330	87.3	2.3	10.4	47.5	4818	86.6	2.3	11.0	40.0
Divorcd, Separated, Widowed	5606	73.4	4.1	22.5	30.9	6782	75.7	3.1	21.2	30.1
Com. Law, Married	1175	75.0	3.4	21.6	56.4	2033	74.0	4.3	21.6	53.0
Immigration Status										
Canadians at Birth	6927	81.6	3.3	15.1	49.8	9329	81.3	3.1	15.5	45.0
Immigrants	3184	70.6	3.6	25.8	21.5	4304	74.9	2.9	22.3	23.7
Accommodation										
Rented	6122	78.1	3.2	18.7	35.6	9000	79.6	3.1	17.3	35.9
Subsidized Housing	1566	80.8	2.9	16.3	38.3	1650	79.3	3.4	17.3	30.2
Owned	714	65.4	5.5	29.1	45.1	1132	66.8	3.1	30.1	42.9
Other	1709	80.9	4.0	15.0	39.0	1851	85.3	2.5	12.2	41.6
Total	10111	78.1	3.4	18.4	37.5	13633	79.3	3.0	17.7	36.7

NOTES: New Entry - not in receipt of benefits in preceding calendar year. Entry Cohort - Entered during a calendar year. Observation period - 5 years, 2004 to 2008 and 2009 to 2013. Disqualified - due to excess Income/Asset and other administrative reasons

Table A6.1: Multinomial Logit Estimates – The Mean Marginal Effects of Recipient Characteristics on the probability of Exit, 2004-2009 Entry Cohorts, Males

Explanatory Variables	No Exit	Died	Excess IA	Disqualified	Other
Disability Type (Mental Disorder)					
Musculoskeletal	-0.0305***	0.000447	0.00362***	-0.0000803	0.0265***
	(0.00436)	(0.00107)	(0.00101)	(0.00106)	(0.00403)
Nerves and Sense Organ	-0.0397***	0.00238	0.00329*	-0.00135	0.0354***
	(0.00597)	(0.00163)	(0.00130)	(0.00121)	(0.00557)
Circulatory	-0.0746***	0.00744***	0.00293**	-0.000216	0.0645***
	(0.00542)	(0.00152)	(0.00108)	(0.00127)	(0.00499)
Other	-0.109***	0.0185***	0.00212**	0.00379***	0.0843***
	(0.00363)	(0.00123)	(0.000661)	(0.000874)	(0.00336)
Age Group (18 - 24)					
25 - 34	-0.0535***	0.00437***	0.00245*	0.00646***	0.0402***
	(0.00445)	(0.00103)	(0.000963)	(0.00131)	(0.00410)
35 - 44	-0.0627***	0.0100***	0.00155	0.00514***	0.0460***
	(0.00420)	(0.00111)	(0.000847)	(0.00117)	(0.00385)
45 - 54	-0.0838***	0.0203***	0.00149	0.00171	0.0604***
	(0.00421)	(0.00133)	(0.000825)	(0.00103)	(0.00384)
55 - 64	-0.283***	0.0296***	0.00594***	0.00161	0.246***
	(0.00594)	(0.00188)	(0.00116)	(0.00114)	(0.00569)
65+	-0.332***	0.00791***	0.0215***	0.00388*	0.299***
	(0.0108)	(0.00216)	(0.00378)	(0.00190)	(0.0105)
Education (0 - 8)					
9 - 11	0.0151***	0.00272*	-0.00184*	0.0000208	-0.0160***
	(0.00425)	(0.00113)	(0.000769)	(0.00111)	(0.00389)
12 - 13	0.00211	0.00242*	0.000425	-0.00136	-0.00359
	(0.00433)	(0.00114)	(0.000825)	(0.00109)	(0.00396)
Post Secondary	-0.00797	0.00256*	0.00201*	-0.00215	0.00556
	(0.00462)	(0.00123)	(0.000922)	(0.00113)	(0.00422)
Marital Status (Never Married)					
Divorced, Separated, Widowed	-0.0289***	-0.000458	0.00155*	0.00189**	0.0260***
	(0.00363)	(0.000967)	(0.000678)	(0.000715)	(0.00338)
Common Law, Married	-0.0336***	-0.00551*	0.00385	0.0224***	0.0129
	(0.0100)	(0.00245)	(0.00216)	(0.00421)	(0.00871)
Family Structure (Couples without Children)					
Couples with Children	0.0239***	0.00276	0.000827	-0.00132*	-0.0262***
	(0.00547)	(0.00164)	(0.000742)	(0.000583)	(0.00511)
Singles without Children	-0.0278**	0.00814***	0.00309**	0.00713***	0.00949
	(0.00920)	(0.00222)	(0.00114)	(0.00103)	(0.00873)
Singles with Children	0.0225*	-0.0000433	0.000627	0.00349	-0.0266*
	(0.0112)	(0.00253)	(0.00162)	(0.00207)	(0.0106)
Immigration Status (Canadians at Birth)					
Immigrants	0.0184***	-0.00284**	-0.00193***	-0.00101	-0.0126***
	(0.00319)	(0.000880)	(0.000553)	(0.000781)	(0.00293)
Accommodation (Rented)					
Subsidized Housing	-0.00126	-0.00230	0.000948	-0.00224	0.00485
	(0.00519)	(0.00136)	(0.000996)	(0.00116)	(0.00479)
Owned	-0.0766***	-0.000550	0.00603***	-0.00251*	0.0736***
	(0.00648)	(0.00157)	(0.00150)	(0.00116)	(0.00606)
Other	-0.00643	0.000380	0.000844	0.00137	0.00383
	(0.00421)	(0.00117)	(0.000813)	(0.00103)	(0.00388)

N = 75887, Mean Marginal Effects, SEs in parentheses, * p<0.05, ** p<0.01, *** p<0.00

Table A6.2: Multinomial Logit Estimates – The Mean Marginal Effects of Recipient Characteristics on the probability of Exit, 2004-2009 Entry Cohorts, Females

Explanatory Variables	No Exit	Died	Excess IA	Disqualified	Other
Disability Type (Mental Disorder)					
Musculoskeletal	-0.0309***	-0.00213**	0.00236**	-0.00121	0.0319***
	(0.00397)	(0.000668)	(0.000881)	(0.000877)	(0.00374)
Nerves and Sense Organ	-0.0360***	0.00257	0.00356*	-0.000568	0.0304***
	(0.00591)	(0.00136)	(0.00140)	(0.00121)	(0.00553)
Circulatory	-0.0786***	0.0125***	0.00138	-0.000157	0.0649***
	(0.00659)	(0.00199)	(0.00120)	(0.00146)	(0.00606)
Other	-0.0954***	0.0163***	0.000574	0.00319***	0.0754***
	(0.00364)	(0.00113)	(0.000666)	(0.000849)	(0.00339)
Age Group (18 - 24)					
25 - 34	-0.0465***	0.00364***	0.00277**	-0.00197	0.0421***
	(0.00479)	(0.000775)	(0.000950)	(0.00171)	(0.00438)
35 - 44	-0.0495***	0.00697***	0.00146	-0.00215	0.0432***
	(0.00454)	(0.000843)	(0.000822)	(0.00170)	(0.00411)
45 - 54	-0.0476***	0.0117***	0.00186*	-0.00527**	0.0393***
	(0.00434)	(0.000920)	(0.000814)	(0.00162)	(0.00389)
55 - 64	-0.270***	0.0149***	0.0107***	-0.00475**	0.249***
	(0.00621)	(0.00124)	(0.00138)	(0.00170)	(0.00590)
65+	-0.352***	0.00625***	0.0391***	-0.00471*	0.311***
	(0.0106)	(0.00132)	(0.00531)	(0.00203)	(0.0102)
Education (0 - 8)					
9 - 11	0.00947*	0.00197*	0.000142	0.00126	-0.0128***
	(0.00404)	(0.000870)	(0.000708)	(0.00107)	(0.00373)
12 - 13	-0.00417	0.00142	0.00159*	-0.000849	0.00202
	(0.00406)	(0.000851)	(0.000743)	(0.00102)	(0.00376)
Post Secondary	-0.0311***	0.000956	0.00314***	-0.00137	0.0284***
	(0.00438)	(0.000881)	(0.000829)	(0.00105)	(0.00408)
Marital Status (Never Married)					
Divorced, Separated, Widowed	-0.0205***	-0.00149	0.00104	0.00246***	0.0184***
	(0.00356)	(0.000789)	(0.000772)	(0.000654)	(0.00335)
Common Law, Married	-0.0861***	-0.00330*	-0.000451	0.0389***	0.0509***
	(0.0102)	(0.00166)	(0.00149)	(0.00478)	(0.00909)
Family Structure (Couples without Children)					
Couples with Children	0.0166*	0.00000984	0.00277	-0.000190	-0.0192**
	(0.00718)	(0.00167)	(0.00260)	(0.000356)	(0.00651)
Singles without Children	-0.0314***	0.00411*	-0.00583*	0.00846***	0.0247**
	(0.00871)	(0.00170)	(0.00284)	(0.000617)	(0.00800)
Singles with Children	0.0179*	0.000509	-0.00590*	0.00709***	-0.0196*
	(0.00887)	(0.00170)	(0.00291)	(0.000869)	(0.00815)
Immigration Status (Canadians at Birth)					
Immigrants	0.0301***	-0.00352***	-0.00345***	-0.00211**	-0.0210***
	(0.00304)	(0.000648)	(0.000550)	(0.000731)	(0.00283)
Accommodation (Rented)					
Subsidized Housing	0.00717	-0.00232**	-0.000661	-0.000647	-0.00355
	(0.00382)	(0.000759)	(0.000723)	(0.000949)	(0.00357)
Owned	-0.0736***	-0.00155	0.00949***	0.0000103	0.0657***
	(0.00604)	(0.000981)	(0.00162)	(0.00130)	(0.00565)
Other	-0.0157**	0.00467***	-0.00000595	-0.00217*	0.0132**
	(0.00494)	(0.00124)	(0.000975)	(0.000906)	(0.00462)

N = 72354Mean Marginal Effects, SEs in parentheses, * p<0.05, ** p<0.01, *** p<0.00

Table A6.3: Multinomial Logit Estimates (exponentiated coefficients) – The Effects of Recipient Characteristics on the probability of Exit, 2004-2009 Entry Cohorts, Females

	Male				Female			
Explanatory Variables	Died	Excess IA	Disqualified	Other	Died	Excess IA	Disqualified	Other
Disability Type (Mental Disorder)								
Musculoskeletal	1.083	1.884***	1.025	1.296***	0.657**	1.470**	0.858	1.352***
	(0.114)	(0.279)	(0.149)	(0.0481)	(0.103)	(0.183)	(0.123)	(0.0462)
Nerves and Sense Organ	1.298	1.825**	0.856	1.398***	1.504*	1.700**	0.959	1.346***
	(0.179)	(0.339)	(0.168)	(0.0669)	(0.260)	(0.282)	(0.178)	(0.0660)
Circulatory	1.910***	1.818***	1.062	1.760***	3.469***	1.368	1.074	1.779***
	(0.191)	(0.302)	(0.188)	(0.0682)	(0.454)	(0.243)	(0.229)	(0.0819)
Other	3.260***	1.689***	1.727***	2.053***	4.266***	1.236	1.630***	1.931***
	(0.224)	(0.207)	(0.164)	(0.0564)	(0.377)	(0.140)	(0.160)	(0.0543)
Age Group (18 - 24)								
25 - 34	2.085***	1.837**	2.282***	1.689***	2.978***	2.085**	0.864	1.758***
	(0.327)	(0.404)	(0.356)	(0.0880)	(0.624)	(0.529)	(0.146)	(0.106)
35 - 44	3.445***	1.570*	2.054***	1.799***	4.750***	1.601	0.850	1.783***
	(0.487)	(0.344)	(0.326)	(0.0903)	(0.926)	(0.410)	(0.141)	(0.105)
45 - 54	6.016***	1.591*	1.435*	2.077***	7.253***	1.749*	0.548***	1.714***
	(0.818)	(0.347)	(0.239)	(0.102)	(1.356)	(0.440)	(0.0946)	(0.0998)
55 - 64	10.88***	4.004***	1.858***	6.659***	12.01***	6.780***	0.803	7.012***
	(1.526)	(0.880)	(0.337)	(0.332)	(2.303)	(1.691)	(0.149)	(0.406)
65+	4.298***	11.62***	2.645***	8.436***	6.693***	23.99***	0.923	9.630***
	(0.924)	(2.948)	(0.619)	(0.534)	(1.605)	(6.585)	(0.233)	(0.658)
Education (0 - 8)								
9 - 11	1.188*	0.690**	0.984	0.875***	1.237*	1.015	1.145	0.894***
	(0.0993)	(0.0968)	(0.119)	(0.0282)	(0.127)	(0.135)	(0.148)	(0.0299)
12 - 13	1.184*	1.066	0.851	0.973	1.187	1.304*	0.898	1.020
	(0.100)	(0.140)	(0.106)	(0.0312)	(0.122)	(0.165)	(0.121)	(0.0332)
Post Secondary	1.209*	1.339*	0.776	1.048	1.165	1.651***	0.860	1.259***
	(0.108)	(0.178)	(0.106)	(0.0352)	(0.126)	(0.208)	(0.123)	(0.0416)
Marital Status (Never Married)								
Divorced, Separated, Widowed	1.007	1.367**	1.380**	1.241***	0.876	1.203	1.573***	1.181***
	(0.0614)	(0.162)	(0.146)	(0.0339)	(0.0719)	(0.147)	(0.188)	(0.0358)
Common Law, Married	0.693	1.871*	5.148***	1.144	0.755	1.027	10.50***	1.582***
	(0.143)	(0.523)	(0.984)	(0.0832)	(0.167)	(0.274)	(1.661)	(0.108)
Family Structure (Couples without Children)								
Couples with Children	1.277	1.203	0.623*	0.786***	0.982	1.213	0.859	0.832**
	(0.200)	(0.220)	(0.117)	(0.0370)	(0.258)	(0.233)	(0.215)	(0.0534)
Singles without Children	1.989**	1.951*	3.042***	1.106	1.704*	0.522*	6.798***	1.241**
	(0.440)	(0.555)	(0.642)	(0.0814)	(0.426)	(0.136)	(1.429)	(0.0888)
Singles with Children	0.969	1.150	1.900	0.784*	1.057	0.487*	5.529***	0.828*
	(0.282)	(0.480)	(0.633)	(0.0775)	(0.279)	(0.136)	(1.229)	(0.0631)
Immigration Status (Canadians at Birth)								
Immigrants	0.805***	0.688***	0.864	0.893***	0.637***	0.537***	0.724**	0.823***
	(0.0515)	(0.0751)	(0.0854)	(0.0225)	(0.0521)	(0.0548)	(0.0764)	(0.0209)
Accommodation (Rented)								
Subsidized Housing	0.851	1.178	0.737	1.037	0.737**	0.885	0.913	0.965
	(0.0894)	(0.190)	(0.134)	(0.0415)	(0.0794)	(0.115)	(0.115)	(0.0310)
Owned	1.061	2.339***	0.775	1.698***	0.906	2.792***	1.097	1.646***
	(0.115)	(0.325)	(0.148)	(0.0643)	(0.118)	(0.316)	(0.177)	(0.0612)
Other	1.033	1.166	1.171	1.036	1.547***	1.018	0.748*	1.122**
	(0.0793)	(0.159)	(0.128)	(0.0339)	(0.152)	(0.164)	(0.108)	(0.0429)
N	75887				72354			

Exponentiated coefficients (RRR), SEs in parentheses, * p<0.05, ** p<0.01, *** p<0.00, Base Outcome -No Exit

Figure A1: Monthly Entries, Exits and Year End Caseload (based on one-month rule), 2003-2013

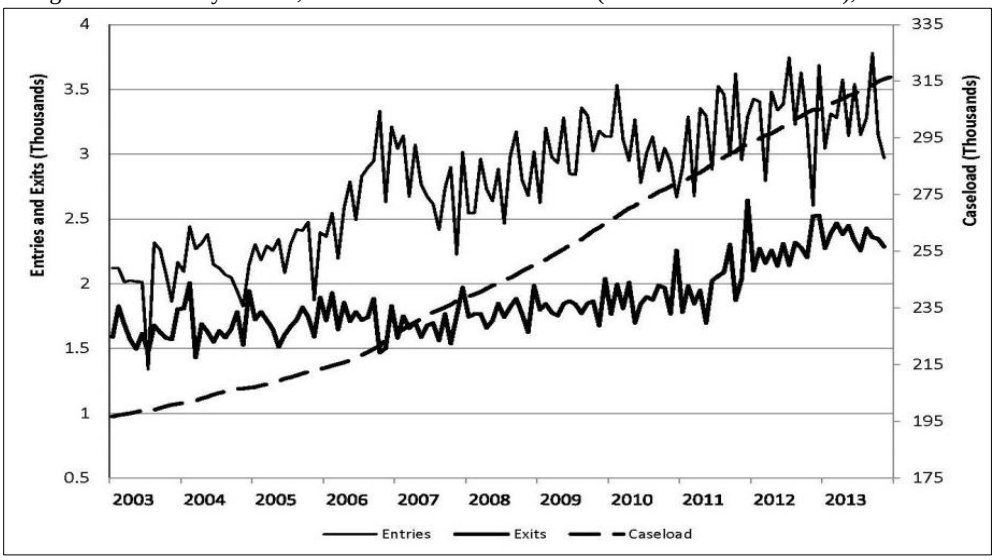


Figure A2: Ratio of Monthly Entries, Exits and Year End Caseload (one-month rule) to Entries, Exits and Year End Caseload (two-months rule), 2003-2013

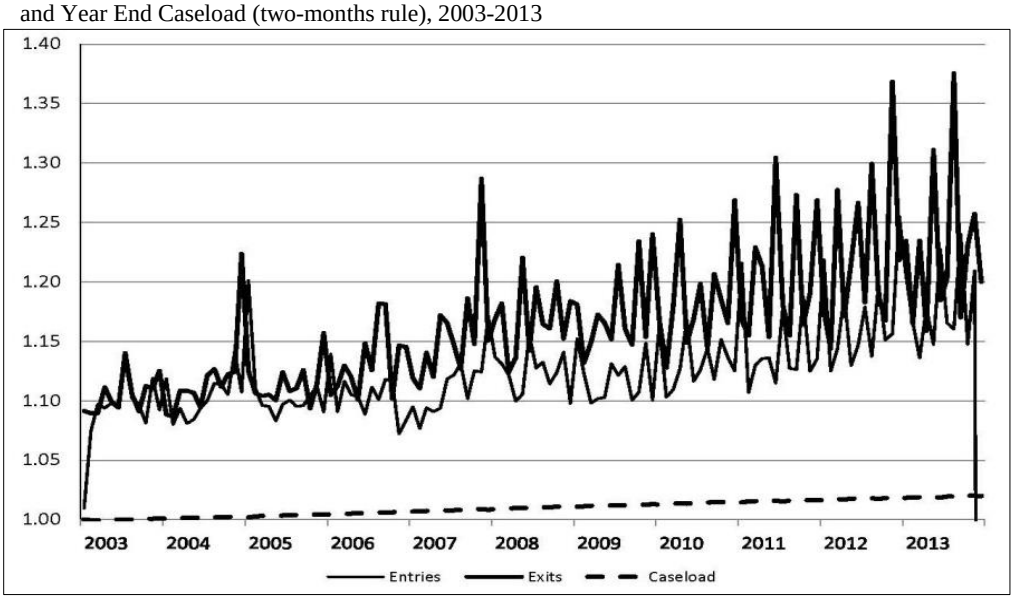


Figure A3: Time to Approval by Application and Approval Years

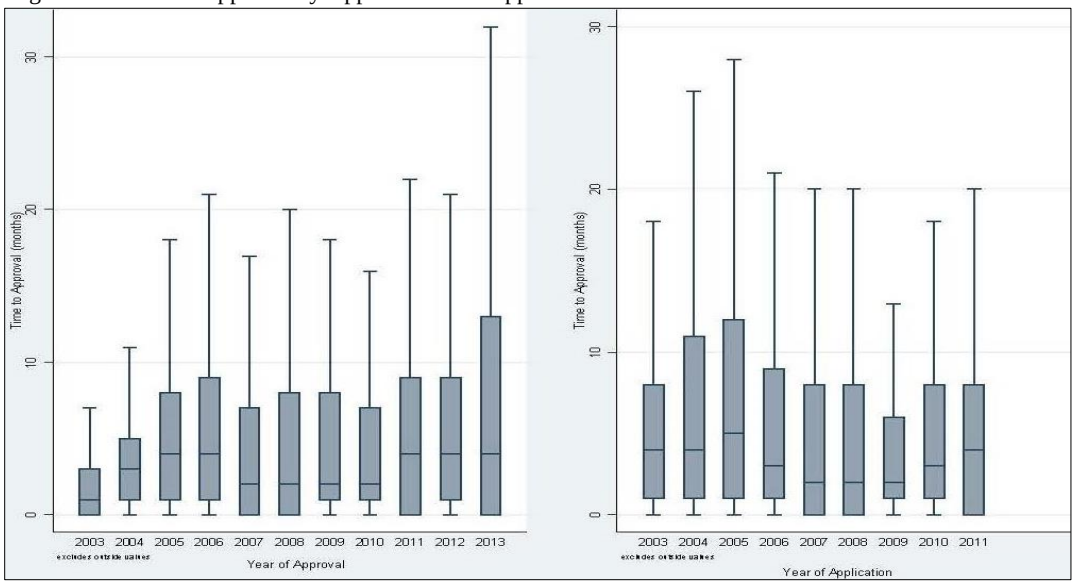
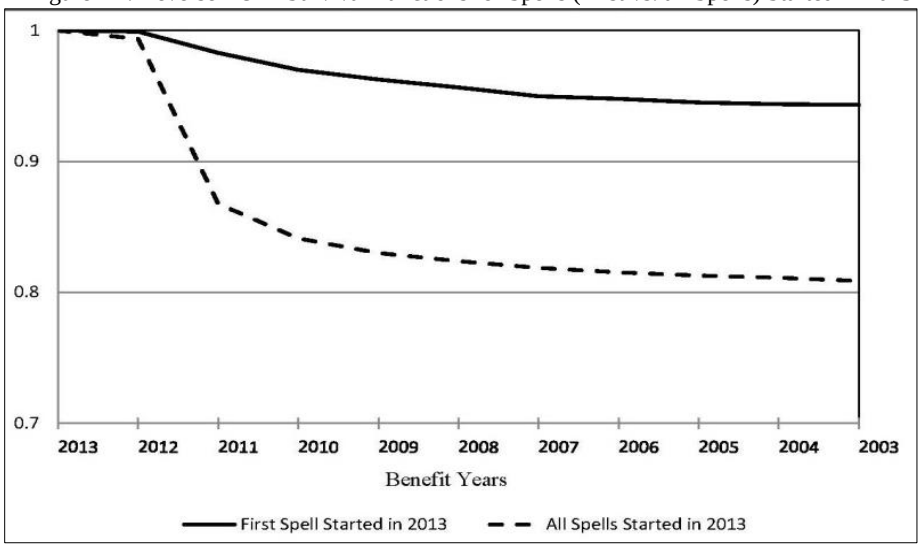


Figure A4: Reverse K&M Survival Functions for Spells (First vs. all Spells) Started in 2013



Chapter 2

Length of Time On and Off the Ontario Disability Support Program Benefits: A Flexible Parametric Duration Model

2.1 Introduction

The Ontario Disability Support Program (ODSP) has been providing income and employment support to persons 18 and older with disabilities since its inception in 1997. There has been a strong growth in the ODSP caseload over the last decade – inflows have been increasing at a much higher rate than the outflows, (6% versus 0.2%). ODSP caseload has increased from 2.1% to 3.9% of the Ontario population 18-54 between 2003 and 2013, an average annual growth of over 7%. See Figure 2.1. Program costs are also on the rise; expected ODSP spending for 2017-18 is estimated to be $5.1 billions as compared to $2.9 billions (in 2017 constant dollars) in 2003-04, [19] an increase of 4.1% per year and accounting for about 3.3 percent of provincial expenditure. [20] This growth is essentially the result of increasing inflows, new entries as well as re-entries, and length of time on the ODSP benefits. The proportion of spells completed within the first five calendar years of their commencement (i.e., everyone is followed for at least four years and one month, and at most five years) decreased from 24% to 19% and the average time on benefits increased from 22 to 24 months between 2004 and 2009.

Understanding the factors influencing the length of time on/off disability benefits is of vital importance, as these factors may influence program costs. More important, prolonged duration on disability benefits may reduce recipients' chances to leave the benefits. Given the high costs to society and to disabled, long

[19] Financial and employment support only. Operating and other related expenses (e.g. drug benefits) are not included.

[20] Ontario Ministry of Finance Budget Estimates, https://www.fin.gov.on.ca/en/budget/estimates/2004-05/volume1/MCSS.pdf and https://www.ontario.ca/page/expenditure-estimates-ministry-community-and-social-services-2016-17.

disability benefit duration is a serious public policy concern. To this end, this study fills a critical knowledge gap by undertaking an empirical analysis of the factors influencing the length of time on/off ODSP.

Earlier international studies suggest changes in both economic and noneconomic factors such as recipients' education and skill levels, immigration status, growth in health care costs, the structure of families, and prevalence of disabling health conditions could have a bearing on program growth. For instance, Rupp and Stapleton (1998), Bound and Burkhauser (1999), Black et al. (2002), and Autor and Duggan (2003) find disability recipients' characteristics are the key determinants, along with health and economic conditions, behind the markedly growing number of disability benefit recipients and prolonged duration on disability benefits.

Rupp and Scott (1995) investigated the impact of the length of time on Supplementary Security Income (SSI) disability benefits on caseloads, program costs, and length of time on other means tested government programs using the US SSI disability program monthly administrative data from 1972 to 1992. The authors found prolonged length of time on benefits was a primary driver of the increased program caseloads and costs. Over one-third of the new recipients stayed on the benefits for over ten years before reaching age 65, with an average first spell length of 5.5 years. However, the average length of time on disability benefits for recipients with multiple spells was 10.5 years. Buddelmeyer (2001) investigated the association between returns to work and length of time on disability benefits in the Netherlands. The authors found high returns to work for those who returned to work within four years. Education and work experience were also found to be positively associated with high returns to work.

Another important determinant of the length of time on disability benefits, often overlooked in the economics literature, is the duration of disability itself. Burchardt (2000) investigated the duration of disability using the British Household Panel Survey (BHPS) and highlighted the heterogeneity of disability in a cross-sectional analysis. The author found that prolonged disability, over four years, resulted in a reduced probability of exit from disability benefits, hence longer duration on disability benefits. A similar

study (Pelkowski and Berger, 2004) also found heterogeneous effects on employability and earnings across disability durations.

A study by Cai (2006) examined the factors that influence the length of time on the Australian Disability Support Pension (DSP) program. The author estimated duration models using DSP fortnightly administrative data at the individual level from 1995 to 2003. The author accounted for the possibility that a proportion of benefit recipients would never exit. The study found heterogeneous effects of recipient characteristics on the length of time on DSP. Female DSP recipients of younger age, having a partner on income support, and having transferred from unemployment benefits were more likely to have longer time on the DSP compared to recipients without these characteristics. The author proposed that the heterogeneous nature of recipient characteristics should be considered when formulating policies to facilitate exits from benefits.

Louwerse et al. (2018) examined the association between the socio-demographic characteristics of the Dutch Social Security Institute (SSI) benefits recipients and outflows from benefits. Most of the benefit recipients, 82%, continued their benefits in the five-year follow-up period. The duration of disability benefits was much longer for older recipients with single or multiple mental disorders compared to individuals with physical disorders. The outflow of disability benefits differed primarily by type of the diagnosis and age; recipients who were diagnosed with cancer died within first year of benefits whereas after four or five years older recipients left disability benefits because of retirement.

Most studies in this literature have investigated beneficiary recipient characteristics using data from non-Canadian social assistance or disability support programs; only a few studies have, somewhat, investigated Canadian disability support programs (e.g., Dooley and Stewart 1999; Campolieti 2002; Mulla et al. 2017). Campolieti (2002) applied a latent variable model to a sample from the National Population Health Survey to analyse the effect of disability status on labour-market participation of older men in Canada. The author found that older-aged, disabled men were likely to stay longer on disability benefits.

Dooley and Stewart (1999) examined the length of time on disability and general social assistance benefits in Ontario. The authors examined the receipt of social assistance benefits and the duration of spells on and off benefits among lone mothers using administrative data for the period 1990 - 1994.[21] They found longer welfare spells for younger, less educated, never married and disabled lone mothers, and that a history of longer welfare use leads to longer spells on welfare and shorter spells off welfare. Though informative, they studied welfare participation of single mothers only and not individuals with disabilities.

In a recent study, Mulla et al. (2017), employed Cox proportional hazard models, using SSQ (Service Santé Quebec) disability benefit claims from Jan. 1, 2007 to Mar. 31, 2014, to examine the association between duration of disability benefit claims and recipient characteristics along with administrative and clinical factors. The authors found longer duration of disability benefit claims for older age females with heavy job demands. Mental disorders, presence of comorbidity, attending independent medical evaluation and receipt of rehabilitation therapy was also associated with longer duration of disability benefits claims.

These Canadian studies are, however, limited in several ways. For instance, Dooley and Stewart (1999), although, considered disability benefit recipients along with social assistance recipients in their study, but the scope is limited to single mothers only. Similarly, Mulla et al. (2017) considered disability claims from all Canadian provinces and territories but about 67% of the claims were from Quebec, therefore, not true representative of Ontario disability. Moreover, they did not account for work related disabilities and the individuals with multiple disabilities. The authors called for research to investigate duration of disability benefits and argued that the identification of the factors influencing the duration of time on disability benefits could help inform public policy.

Disability related benefits dependence and prolonged time on the ODSP are important policy issues for program administrators in Ontario. Identifying the recipients' characteristics that could potentially influence the length of time on/off ODSP is vital to reducing disability benefits dependence. Surprisingly,

[21] Clients of Family Benefit Act are classified as 'disabled' or 'sole support parent'

little is known about the relevant factors. This paper fills a knowledge gap by providing an empirical analysis of the factors influencing the length of time on/off ODSP receipt using individual-level administrative data from 2003 to 2013.

The remaining sections of this paper are as follows. Section 2 describes the administrative data used in this study and Section 3 presents descriptive analysis for ODSP. Section 4 describes the estimation strategy and Section 5 presents the results. Finally, Section 6 concludes with a summary and a discussion of policy implications.

2.2 Data Description and Key Definitions

Since its inception in 1997, ODSP has been providing income and employment support to persons with a disability who are 18 and older.[22] To be eligible for ODSP income support, applicants are subject to residency, income/assets, and disability tests; they must be residents of Ontario, must need financial support (have little or no other source of income, and assets worth no more than $40,000), and must have substantial mental or physical impairment that is expected to last for one year or longer. The impairment is substantial if it restricts applicants' ability to care for themselves, function in the community, or work. ODSP, unlike social assistance, has no mandatory work requirements and no time limits for benefits receipt.

The ODSP administrative data files made available for this study are for the time period from 2003 to 2013 and contain monthly records of the amount and type of disability benefits received, along with information on demographic and related characteristics of recipients including sex, age, family structure (marital status and number of children), education, immigration status, accommodation, and the diagnosis of the underlying health condition. Although some of the explanatory variables (e.g., age, education, marital status etc.) may vary over time, we find little change, with the exception of age. In practice we include their values only at the time of entry; hence all are treated as time invariant for the purposes of our analysis. We use this information to identify how the recipients' characteristics influence the length of time on/off ODSP. For all

[22] The rule of age 18 or older is subject to certain exceptions.

analyses, we use working age recipients and exclude recipients under the age of 18 and over the age of 54. The data also include information on the recipients' date of entry into and exit from ODSP, but identification of exact entry and exit dates is complicated by data definitions, rule changes, and censored observations. We clarify these problems and justify our definitions of entry and exit below.

In principal, the entry date can be determined by a date of application field, but we found inconsistencies in many instances. More importantly, the policy on payout relating to the time from application to approval (i.e., the waiting period) changed in September 2006. Specifically, the previously implemented "4-month rule", which stipulated that the extra payout related to disability benefits in the waiting period would cover a maximum of four months, was revoked.[23] Because ODSP applicants would typically be on Ontario Works social support during the wait time, the calculation of wait time related reimbursement would cover the difference in benefits expected between the two programs (based on complicated formulas involving income, family structure, etc.). Because recipients generally receive some coverage during the waiting period, we avoid trying to account for differences in the waiting period, but rather use the approval date as the date of entry into benefit coverage.[24]

Identification of exits is complicated due to data definitions related to recipient status (active, not active). For instance, if benefits are suspended temporarily (for a period that may be up to one year), the status ('active') and termination reason ('continue') remain unchanged even though the recipient does not receive benefits. The recipient is considered to have exited only if terminated permanently and a termination reason such as 'left', 'died', or 'moved' is provided. We therefore make use of the payment record to define exit and any subsequent re-entry based on breaks in benefit payments. By our definition, an exit from benefits occurs if there is a break of at least two consecutive months in benefit payment. This "two months" rule is an approach commonly used to define spell/exit.[25] A common view supported by the existing literature is

[23] Disability benefits are much higher (over 70 percent) than the base-level welfare rates (John et al., 2014).
[24] For distribution of wait times see Figure A3 in Appendix I.
[25] For instance, Dooley and Stewart (1999), Barrett (2000).

that a shorter absence from payment, say one month, may not represent a true exit because such a break could have resulted from administrative reasons such as missing information, non-compliance, etc.

Since the behaviour of benefit recipients may differ after a first entry into ODSP, the analysis focuses on the first spell only; the subset of recipients who enter the system for the first time. Identifying this subset in a manner that is consistent across time is complicated by the left censoring problem associated with identifying a first entry. That is, for benefit recipients entering in 2013, we have a full 10-year history of previous spells, but for those in 2004 we see only one previous year. Thus, we define first spell or first entry to include the recipients in receipt of benefits in one calendar year, whether, say, 2004 or 2013, but not in the preceding calendar year, 2003 or 2012. This makes our definition consistent across time and avoids artificial trends associated with changing inclusion criteria.

Although our definition of first spell eliminates the bias over time due to left-censoring, it introduces measurement error, since some first entrants according to our definition will not be true first entrants. To get a sense of how large this group may be, we validate our first spell definition using the 2013 entry cohort (recipients who entered in the 2013 calendar year), observing their history back to 2003. This allows us to count the number of 2013 entrants, using our definition, who have received benefits in the prior 10 years and were thus not truly first entrants. We find that only 6 percent of the 2013 entry cohort (i.e., those with no receipt of benefit in 2012) had previously been on ODSP for at least one month between 2003 and 2012. Thus, our definition of first spell seems a reasonable approximation of a genuine first spell.[26]

The administrative data provide a rich set of covariate information which may help to explain exits from ODSP, as well as the length of time on/off ODSP. Disability type is also a primary factor that could influence the length of time on/off ODSP. For instance, people with cognitive and mental disorder have been found to face greater employment challenges than people with sensory and other physical disabilities (Arim, 2015), and therefore are expected to have prolonged stays on ODSP. Most likely, people with more

[26] See Figure A4 in Appendix I

severe disabilities have significantly lower employment opportunities than those with less severe disabilities (Turcotte, 2014). As per the Canadian Survey on Disability (2012), only 12 percent of people reporting disabilities were employed. This employment level ranged from 18.6 percent to 12 percent to 9.6 percent for people with mild, moderate and severe disabilities, respectively.

In the administrative data, disability type is identified using International Classification of Diseases, 9th revision (ICD 9) codes. In this coding system, disability types fall into 17 broad categories.[27] We compress them into seven categories: Mental Disorders, Musculoskeletal, Nervous System & Sense Organ Disorders, Circulatory, Infectious, Congenital and Other. The first six categories are presented from largest to smallest based on the number of recipients in the dataset; the last, "Other" combines the remaining 11 disability categories (each of these represents less than 3 percent of recipients). This ensures that MCSS requirements relating to minimum cell size for disclosure are satisfied.

The type, nature and severity of disability have been found to vary by sex and across age groups. Disability increases with age (Cai and Gregory, 2003) and younger disability recipients are more likely to exit (Buddelmeyer, 2001). Although age varies over time, we consider its value at time of entry; hence treated as time invariant. Age at entry is treated as a categorical variable to allow ease of interpretation and flexibility for capturing non-linear effects. Age is classified into the following four age groups: 18 - 24, 25 - 34, 35 - 44, and 45 - 54. Although the age of onset of disability is an aspect worth considering as a determinant of exit from disability, this information is not available.

Family structure, including marital status, may also have an impact on exit from benefits, hence length of time on/off ODSP. For instance, we anticipate that those married or living common law are more likely to exit due to excess income or assets as compared to divorced, separated or widowed. To account for marital status, we classify marital status into three categories: Never Married; Divorced, Separated, and Widowed; and Legal Common Law and Married. The presence and number of children may also have an impact on

[27] http://icd9.chrisendres.com/index.php?action=contents

exit from benefits. Many studies find singles with children are less likely to exit than couples with or without children. To this end, four dummy variables are created to represent this additional aspect of family structure: none, one, two, and three plus children.

Uptake of disability benefits by immigrant status has been a focus in the literature; however, the evidence that it has a bearing on disability benefits receipts is not conclusive.[28] While the focus is not the impact of immigrant status on disability benefits duration, Cai (2006) shows that immigrants, especially immigrants from non-English speaking countries, are more likely to stay longer on disability benefits than immigrants from English speaking countries and the native born. To provide some information about the impact of immigrant status on the length of time receiving disability benefits, we have classified the disability recipients into Canadian-born and Immigrant.

Many studies find the exit from benefits to be increasing in education (e.g., O'Neill et al., 1987; Blank, 1989; Fortin and Lacroix, 1997; Barret, 2000). Our dataset has information on educational attainment. We have classified it into four groups based on the number of years of schooling: elementary and middle school (0-8), some high school (9-11), high school completed (12-13), and some Post-Secondary.

Pudney (2010) finds that older homeowners are less likely than older renters to claim disability benefits (specifically, the so-called Attendance Allowance) in the UK. The impact of accommodation type on the length of time on/off ODSP may be important. We can identify recipients who live in subsidized housing; a factor that has received little attention but might have heterogeneous effects on exit rates. For instance, an increase in earned income exemptions is more attractive for those in rental or owned accommodation than those living in subsidized housing. That suggests that there is less incentive for those in subsidized housing to participate in the labour market and hence to exit disability benefits. To account for accommodation differences, we have classified the sample into four groups: Subsidized Housing, Rented, Owned, and Other Accommodation. Several accommodation situations are combined in the last category

[28] For a review, see Barrett, A., and McCarthy, Y. (2008) and Kerr, W. and Kerr, S. (2011)

such as boarding and lodging, nursing homes, and community resource centers, each of which accounts for only a small proportion of recipients.

2.3 Descriptive Analysis

The presentation that follows is focused mostly on duration analysis, considering recipients who have entered the system for the first time, but it is helpful to first consider descriptive characteristics, e.g., who receives benefits, who remains on the benefits, who exits, and among those who exit, who cycles back. Evidence on these dynamics may help inform the possible redesign of disability policy. As Walker and Ashworth (1994) warn, a static concept of disability may lead to unrealistic policy responses.

2.3.1 Summary Statistics

Table 2.1 shows summary statistics – completed, censored and total spells of the recipients who have entered the system for the first time between 2004 and 2013. Of the whole sample, only 20% of new entrants have completed their first spell within five calendar years whereas 80% are right censored. The average length of time on benefits for the completed and censored spells is 2.5 and 4.4 years respectively.

Looking first to disability types, while mental disorders account for more than half of the total recipients, 52%, the proportion who have completed their first spell is only 40%. Among mental disorders, psychoses account for about half of the total spells and makeup highest proportion, 55%, of the completed spells whereas retardation accounts for only 12% of the total spells and makeup the lowest, 8%, of the completed first spells. This implies that recipients with a mental disorder are less likely to leave the disability benefits, and among mental disorder recipients, those with mental retardation are least likely to leave the benefits.

Although the proportions of completed, censored and total spells generally increase with age, the proportion of completed spell at older ages is much higher, 40%, than the proportion of censored spells, 32%. For instance, while the oldest recipients account for 34% of the total spells they make up the largest proportion of the completed spells, 40% whereas the youngest recipients account for 22% of the total spells but they

makeup the smallest proportion, 14%, of the completed spells. This indicates that the probability of exit from benefits increases with age. The higher probability of exit from disability benefits at older ages could partly be attributed to recipients' eligibility to alternative support programs (e.g., Canada Pension Plan, Old Age Security etc.). The proportion of recipients who have completed their first spell increases in education as well, though the magnitude of the effect is modest. For instance, while recipients with post secondary education account for only 23% of the total spells they makeup 29% of the completed spells.

Singles - never married, divorced, separated, and widowed- together account for over 85% of the total spells, about same percentage of the censored spells and 75% of the completed spells. While couples - married and living common law - account for only 15% of the new spells, and makeup 21% of the completed spells. This points to the fact that married recipients or those living common law are more likely to complete their first spell than singles.

Recipients who rent form the largest group in terms of accommodations, accounting for 81% of the total. While recipients with owned accommodation account for only 2% of the total spells, they makeup 11% of completed spells. The share of Canadians at birth and immigrants is evenly distributed across the completed, censored and total spells. Males are slightly more likely to receive disability benefits and their proportion of completed spell is also slightly higher.

2.3.2 Length of Time On/Off ODSP

Annual entry rates for the years 2004 to 2013 are presented in Table 2.2, along with number and percent of new entrants. The entry rate (ER) is the first entrants, not in receipt of benefits in the preceding calendar year (t-1) who are in receipt in t (current/entry year), per 1000 population. Formally, $ER_t = \frac{First\ Entry_t}{Population_t} * 1000$. The rate of first entry has increased from 2.21 to 2.84 per 1000 for individuals 18-54 in Ontario between 2004 and 2013, an average annual growth of about 3%.

The length of time on disability benefits is measured as the number of months between first entry into and first exit from the system. We follow recipients for five calendar years from spell commencement. This

approach facilitates meaningful comparisons and valid inferences about the effects of recipient's characteristics on the duration of disability benefits.

Table 2.3 shows the distribution of length of time on disability benefits of the first spell by entry cohorts, 2004-2009.[29] As mentioned before, we follow the recipients for five calendar years following the commencement of their first spell (including the year of the initial claim). While overall, 21% recipients have left the program within five years, the proportion of recipients completing their first spell has fallen from 24% in 2004 to 20% in 2009, a decrease of 3% per year. The proportion of completed spell has decreased by 3% for the shortest length of stay, up to six months, and has increased by 4% for the longest length of stay, 36 to 60 months, during 2004 and 2009. This phenomenon indicates that length of time on the benefits has increased. The share of cohort entries (total spells) has also increased from 14% to 19% during 2004 and 2009, an average of over 5% growth per year. Both factors, increased benefit duration and inflows, contribute to the increased caseload and program costs.

Table 2.4 shows the distribution of recipients who have returned to the program after the first non-death exit by time to re-entry. The analysis for the entry cohort sample, 2004-2009 (exited and returnded within five calendar years of first entry), is presented in panel A, while that for the whole sample, 2004-2013 (exited and returnd any time during 2004 to 2013), is in panel B. About 18% of the whole sample left the system due to reasons other than death and 33% of these returned to benefits receipt. These proportions for the entry cohort sample, 2004-2009 (within five years), is 19%. Highest return rate is associated with the shortest, time to re-entry, 2 - 6 months; about half of the recipients who leave the system return back to the benefits receipt within six months. While, on average, length of time off benefits is 16 and 18 months for the entry cohort sample and the whole sample respectively, the average length of time off benefits is only three months for short off spells (2 to 6 months) and 33 to 42 months for long off spells (>24 months). This indicates the fact that most of the off spells are very short lived hence prolonged on spells.

[29] See Table A1 for multiple spells in Appendix II

To have a sense of the variation overtime in the exit and return rates, we compare two distinct entry cohorts: 2004 and 2009. The distribution of recipients by the length of time off benefits for the 2004 and 2009 entry cohorts is presented Table 2.5. Overall, the non-death exit rate decreased 22% to 19% between 2004 and 2009. Although, the non-death exit rate for the shortest re-entry time, 2 to 6 months, decreased marginaly, the share of recipients who returned in the same re-entry time category increased notably from 45% to 51% between 2004 and 2009.

Duration analysis, a common approach to describe the length of benefit spells, uses the concept of the 'hazard rates'. Hazard rates are estimated to provide an overview of the micro transition dynamics of the benefit recipients' exit and duration patterns. Since the hazard rate measures the exit rate as a function of time on benefits, a declining hazard rate implies that the longer is the time on the benefits the lower is the likelihood of a benefit recipient leaving the program. Hazard functions are presented in Figures 2.2 and 2.3 to further explain the duration distribution of the 2004-2013 sample. Figure 2.2 plots non-parametric hazard functions for each year of the whole sample whereas Figure 2.3 plots the associated hazard function aggregated across all entry cohorts.

Hazard rates presented in Figure 2.2 highlight two aspects of the exit probability: over time and across entry cohorts. First, the hazard rates of recent entry cohorts are lower than the hazard rates of their predecessors, with the decline occuring in the early years. Second, the hazard rates increased for the duration of first to second year and start to decline afterwards. One of the possible reasons of the increased hazard rates after one year of entry could be the yearly disability eligibility review. Alternatively, this initial increse in hazard rate and then deline may be due to the fact that a person with disability is less likely to find employment if he/she could not find any early on. For instance, Cheadle et al. (1994) found that a benefit recipient is less likely to find employment if he/she fails to do so within the first two years of disability benefit receipt. The cumulative hazard function exhibits the same exit pattern as Figure 2.2 and points to the fact that recent recipients tend to stay on benefits longer than their predecessors.

In this section we display individual-level dynamics of the exit rate in a spell-based perspective. To have a better understanding of how the changing mix of new recipients affects the duration of benefits and program costs, it is important to analyse how recipients' characteristics such as disability types, age, education, marital status etc. are associated with benefit receipt duration. To determine the bivariate relationships between recipients' characteristics and the length of time on ODSP, we make use of Kaplan-Meier (KM) survival curves. These are used to measure the fraction of recipients receiving benefits for a certain amount of time starting from a given entry time to the occurrence of an event, i.e., exit from disability benefits. The KM survival functions are presented in Figures 2.4.1 and 2.4.2.

Starting with disability type, recipients with mental disorders are likely to stay longer than those with other disability types. For instance, about 30% of those diagnosed with a mental disorder left benefits, as opposed to over 60% of those with "other" disorders, within five years initiating receipt. Among subcategories of mental disorder diagnoses, recipients with mental retardation are likely to stay longer on benefits. The exit rate is increasing in education and age, which implies that recipients with low education and younger ages stay longer on benefits. For instance, within five years of starting benefits only about 25% of recipients with the lowest education (0-8) have left benefits, compared to over 40% of those with the highest education.

Recipients who have never married, or who are divorced, separated, or widowed, stay on benefits longer than those who are married or living common law. For instance, after five years of benefits only about 30% of the never married have left benefits as opposed to 50% of those who are married or living common law. The presence of children further prolongs the time on benefits. Canadians at birth are more likely to stay on benefits than immigrants; however, the difference is not large. Those who do not own their accommodations stay longer on benefits than those who not.

2.4 Empirical Approach

We begin the empirical analysis by identifying the factors affecting the length of stay on ODSP employing the popular semi-parametric Cox Proportional Hazards (PH) model (and extensions). This model, using recipients' characteristics as predictors of survival time, is spelled out as follows. Let $h(t|x)$ be the hazard rate associated with a benefit spell which will end at duration t, the Cox model assumes proportionality between time and other covariates of the form,

$$h(t|x) = h_0(t)\delta(x) \quad (1)$$

where the hazard $h(t|x)$ is the product of two quantities: the baseline hazard function $h_0(t)$ is treated as a nuisance parameter and is left unspecified, which makes the Cox PH model semi-parametric. Since the hazard cannot be negative, the most common parametrization is,

$$h(t|x) = h_0(t)\, e^{\beta_i x_i} \quad (2)$$

The partial likelihood method is used to estimate β_i (partial since the $h_0(t)$ portion is concentrated out and not estimated) based on the observed order of events (exit). That is why the likelihood function is called a "partial likelihood" function.

The principal assumption of the Cox proportional hazard model is that the relative hazard, exit from disability benefits at a given point in time, is constant over time. For instance, if recipients with a physical disorder are twice as likely to exit from ODSP as recipients with mental disorder at 3 months, then they should also be twice as likely to exit at 6 months, one year, and so forth. To validate the appropriateness of this proportionality assumption, we use both graphical and statistical techniques. The statistical techniques rely on a standard post estimation technique in which we construct Shoenfeld residuals after fitting a Cox model, and then tests whether the residuals are correlated with ranked failure time. There should not be a correlation if the PH assumption holds. Most of the variables included failed to meet the proportional hazard assumption. For a graphical assessment of the PH assumption we used log-log survival curves stratified by

recipients' characteristics. If the PH assumption holds, these curves should be parallel. Again, we found this to be violated in many instances.

Violation of the proportional hazard assumption suggests time dependent effects of recipients' characteristics on the probability of exit from ODSP. Therefore, we divert our attention to the flexible parametric techniques (and extensions: cure models to account for the proportion of recipients that never exit the disability benefits), developed in Royston and Parmar (2002), which model the baseline hazard as restricted cubic spline transformations of an underlying parametric specification. This technique also has a built-in feature to conveniently model time dependent effects of covariates interacted with a flexible spline function of analysis time.

Our descriptive analysis suggests that both features, flexibility and time dependence, are important to properly model time to event outcome, i.e., exit from disability benefits. Moreover, a higher exit rate early on (first one and half years), which rapidly declines, indicates that traditional parametric survival models lack the flexibility which is needed to model the baseline hazard. There is also a strong indication that time dependent effects are present, along many covariates. The Royston-Parmar modelling setup handles these issues nicely. The cubic spline specification and knot choice for splines was based on minimizing AIC.

Following Royston and Parmar (2002) and Royston and Lambert (2009), a generalized cubic spline flexible parametric model is spelled out as follows. Consider a proportional hazard model modeled on the log cumulative hazard scale

$$\ln[H(t|x_i)] = \ln[H_0(t)] + x_i\beta \tag{3}$$

Using restricted cubic splines with knots, k_0, the log baseline cumulative hazard is modeled as

$$\ln[H(t|x_i)] = m_i = s(\ln(t)|\gamma, k_0) + x_i\beta \tag{4}$$

and the hazard function can be written as

$$h(t|x_i) = \frac{ds(\ln(t)|\gamma, k_0)}{dt} e^{(m_i)} \tag{5}$$

A standard duration model assumes that all benefit recipients will eventually exit from benefits, which is an unreasonable assumption in the context of this analysis. For instance, in this analysis we are trying to explain the timing of recipients' exit from benefits, but we know that the majority of benefit spells are of long duration and not all recipients experience a non-death exit, a factor not accounted for by a standard duration model. Split Population Models (SPM) or Cure Rate Models relax this assumption by splitting the observations under analysis into two subpopulations, one that will eventually experience the event of interest (exit) and one that will never experience the event. We use cure rate models to investigate the heterogeneity between benefit recipients who are long-term survivors and stay longer on the benefits from those who are not.

The survival trends shown in Section 3.3, suggest the presence of long-term survivors in the sample. We see that the survival curve has a plateau at the end of the study period that suggests the cure rate models can be a useful alternative. Cure rate models enable us to distinguish between the covariates associated with short-spells and long-spells. For instance, we can evaluate whether recipients' characteristics such as education, age are associated with an increase or decrease in the probability of being a long-term or sort-term benefit recipient.

The flexible parametric cure models predict the proportion of recipients who are expected to never exit from benefits, cure fraction, by modeling the log cumulative excess hazard, $\ln(\boldsymbol{\Lambda}(t))$, using restricted cubic splines, $s(\ln(t); \gamma_0)$. Excess hazard is the difference between the hazard functions for observed hazard, $h(t)$, and expected, $h^{/}(t)$, hazard; $h(t) - h^{/}(t) = \boldsymbol{\lambda}(t)$. Cure is determined when the difference between observed hazard and expected hazard reaches zero, $h(t) - h^{/}(t) = 0$. Cumulative hazard estimates, $\boldsymbol{\Lambda}(t) = H(t) - H^{/}(t)$, can be obtained by integrating the excess hazard and observed hazard estimates.

The log cumulative excess hazard, $\ln(\boldsymbol{\Lambda}(t))$ can be used to predict relative survival, $R(t)$, as follows.

$$\text{Ln}[-\ln(R(t))] = s(\ln(t); \gamma_0) \quad (6)$$

Where Ln[-ln(R(t))] = ln(**Λ**(t)) and s(ln(t); γ_0) is the restricted cubic splines of the log survival time, t, where γ_0 contains the parameters of the spline.

Cure is determined when the difference between the observed and expected hazard reaches zero, h(t) – h′(t) = 0. This can be accomplished by constraining the log cumulative excess hazard function to have zero slope after a certain point in time. The relative survival function is defined as

$$R(t) = \exp[-\exp(\gamma_{00} + \gamma_{01} z_1(\ln(t)) + \cdots + \gamma_{0k-1} z_{k-1}(\ln(t)))] \quad (7)$$

Where $\gamma_{01, \ldots, \gamma_{0k-1}}$ are the parameters and $z_1(\ln(t)), \ldots, z_{k-1}(\ln(t))$, are the basis functions.

Incorporating covariates, this can be written as

$$R(t) = \exp[-\exp(\gamma_{00} + x\beta) + \gamma_{01} z_1(\ln(t)) + \cdots + \gamma_{0k-1} z_{k-1}(\ln(t))] \quad (8)$$

Time dependent parameters can be incorporated as follows

$$R(t) = \exp[-\exp(\gamma_{00} + x\beta) + \gamma_{01} z_1(\ln(t)) + \cdots + \gamma_{0k-1} z_{k-1}(\ln(t))] + \sum_{i=1}^{D} s(\ln(t); \gamma_i) x_i)] \quad (9)$$

The cure fraction for x covariates is $\exp[-\exp(\gamma_{00} + x\beta)]$

The constant parameters are used to model the cure proportion and the time dependent parameters are used to model the distribution function.

2.5 Empirical Results

Standard Flexible Parametric RP models for on benefits (On Spell) and off benefits (Off Spell) are presented in Tables 2.6 and 2.7 respectively. (Cure model estimates are presented in Table A2 in Appendix II.)

2.5.1 On Spell, Standard Model

For the ease of interpretation, hazard ratios (exponentiated coefficient estimates) of a standard flexible parametric model for on spells are presented in Table 2.6. The reference group for each explanatory variable is indicated in the 'explanatory variables' column; for example, 'Other' is the reference category for 'disability type'. The hazard ratio for a category, say mental disorder, is the ratio of the hazard rate of a recipient belonging to that category to the hazard rate of a recipient who belongs to the base category.

Moreover, a hazard ratio greater than one implies a higher probability of exit from benefits, and a ratio less than one implies a lower probability of exit.

Starting with disability type, the recipients with a mental disorder are less likely to exit. By way of example, *holding other regressors constant*, the probability of exit from benefits of a person with a mental disability is about half that of someone in the other disability type category.

In terms of age, the estimates are statistically significant for all age groups except '25-34' age group in case of non-death exit that implies that '25-34' age group is not different than the base category, 45-54 age group. The estimates suggest that probability of exit generally increases with age – older recipients are more likely to exit. For instance, youngest (18-24) recipients are 14% less likely to exit than the oldest (base) category. The reason for a significantly higher probability of exit for older recipients could include retirement and moving to other alternative support programs such Old Age Security, Canada Pension Plan etc.

The hazard ratio estimates for education imply that exit is increasing in education, which is in line with the findings of the existing literature. Recipients with the lowest education attainment level (0-8) are about 43 % less likely to exit than people with post-secondary education, the base category.

The hazard ratios for the marital status suggest that recipients who are married or living common law are more likely to exit than recipients who have never been never married, or are divorced, separated, or widowed. For instance, the recipients who are never married or are divorced, separated, or widowed are about 52% and 32% less likely to exit respectively than the recipients who are married or living common law. Single parents (single mothers and singles fathers) are more likely to stay on benefits than couples with children. For instance, the hazard rate for singles without children is higher than singles with children, the base category. Similarly, the hazard rate for couples without children is higher than that of couples with children. This implies that presence of children decreases the probability of exit from benefits.

Estimates for accommodation type are statistically significant for all the accommodation categories. Recipients who rent, living in subsidized housing or other are less likely to exit than homeowners, the base category. Among the accommodation categories, subsidized housing and 'other' are least likely to exit. This implies that if a homeowner, the base category, had rented a house from government, subsidized, his/her probability of staying on benefit would increase by 33%. In terms of immigration status, immigrants are less likely to exit as compared to Canadians at birth. Finally, males are slightly more likely to exit than females.

The estimates of the hazard ratios provide important insights into how the various explanatory factors – disability types, age, education, family structure, marital status, immigration status, accommodation type and sex – are associated with the probability of exit from ODSP. Recipients with mental disorders, who are younger, less educated, and single are less likely to exit ODSP relative to other groups. The presence of children also reduces the probability of exit from ODSP relative to not having any children.

2.5.2 On Spells, Cure Model

We employ cure rate models to identify the recipients' characteristics associated with the probability of eventually leaving the benefits. The hazard ratios estimated by employing the cure rate models, presented in Table A2 in the Appendix II, are generally like the estimates of a standard model presented in Table 2.6. However, cure rate plots for recipients' characteristics presented in Figure 2.5 provide an insight into the covariates associated with the short-spells and long spells - higher cure rate implies long spells and lower cure rates shorter spells.

Starting with age, the cure rate for the four age groups is generally decreasing in age which implies that younger recipients are likely to stay longer on ODSP than older recipients. For instance, the youngest (18-24) recipients are about 5% more likely to have a longer benefit spell than the oldest age group (45-54). Middle age recipients 25-34 and 35-44 are not statistically different from each other. The cure rate for education categories is decreasing for higher education categories, which implies that higher education is

associated with shorter benefit spells. For instance, the recipients with the least education (0-8 years) are about 25% more likely to have a longer benefit spell than the recipients with the highest education (post-secondary).

In line with the estimates presented in the previous section, recipients with mental disorder are about 20% more likely to stay longer on ODSP than recipients with musculoskeletal, nerves and sense organ and other disability. Recipients living in subsidized housing or other accommodation are about 20% more likely to have longer benefit spells than homeowners. Never married recipients are about 26% more likely to stay on ODSP than married or living common law recipients. In other words, the duration of benefit spell could be reduced considerably if never married recipients were married. Presence of children also bears on the duration of the benefit. Presence of children leads to longer benefit spells for both singles and couples. In terms of immigration status, immigrants are likely to stay on ODSP for a longer time compared to Canadian-born recipients.

2.5.3 Off Spell

We would like to gain a better understanding of the factors associated with sustained exits since a temporary exit is not desirable from the perspective of either the benefit recipient or public policy. To this end, the estimates presented in Table 2.7 provide information about the duration of time off ODSP following the end of a first spell. Since the rate of return to ODSP should exclude those who died, we present hazard ratios of off spell time after a first non-death exit. In the context of being in an off spell, a hazard ratio of greater than one means higher likelihood of recipients returning to the benefit program.

Flexible parametric models, with and without time dependent effects, are estimated for the first off spell period. The effect of a covariate is time-dependent if the relative effect of a covariate varies over follow-up time. Although the recipients' characteristics used in the modeling do not vary with time since they are measured at time zero or entry, there could be time dependent effects of these time invariant covariates (i.e., their impact on re-entry varies with time off benefits).

In line with the previous analysis, recipients with a mental disorder are more likely to return to benefits after first non-death exit. Furthermore, the relative effect of mental disorder slightly increases with follow-up time. Estimates of time dependent model for disability types other than mental disorder are not statistically significant, hence we observe no time dependent effects except for that of mental disorders. The likelihood of returning to benefits decreases with age. That may be the case because older recipients may move to alternative benefits programs such as Canadian Pension or Old Age Security.

The hazard ratios for education generally imply that re-entry is decreasing in education (except for the lowest education group). However, estimates for the time dependent effects model are not statistically significant, hence there are no time dependent effect of education.

The estimates for marital status imply that those never married are 31% less likely to return than those married or living common law and their likelihood of re-entry decreases slightly over time. The estimates for the remaining categories -- separated, divorced, widowed, and singles and couples with or without children—do not suggest any time dependent effects. While a higher likelihood of exit from benefits is generally associated with a lower likelihood of re-entry, for those married it is associated with a higher likelihood of return. A possible explanation is that the analysis does not account for a possible change in marital status; it could be that many of those who return are no longer married. Accommodation and immigration status have no effect on the re-entry as none of these are statistically significant. Females are slightly more likely to return to benefits than males.

2.6 Conclusion and Policy Implications

We have analysed the duration of ODSP benefit receipt of individuals aged 18-54 in Ontario using administrative data files from 2003 to 2013. We have employed flexible parametric models to explore benefit duration from three different angels; time spent receiving benefits, cure rates, and time spent not receiving benefits. The first analysis provides insight into duration on the benefits (on spells) followed by

the cure rate analysis that re-affirms these findings. Finally, we turned our focus to the dynamics of the nature of first exit, re-entry to the benefits (off spells) after a first non-death exit.

Although the prevailing perception is that exit from disability benefits is not very common, we find that about 20% of benefit recipients completed their first spell and 80% were right censored. The average duration of completed and censored spells, within five years of the commencement of a spell, was 2.5 and 4.4 years respectively. Of the recipients who exited from benefits about 33% returned to benefits within, on average, 1.6 years. The estimation results show a clear association between the time invariant individual characteristics of benefit recipients and the duration of benefit spells.

Recipients with a mental disorder (which accounts for about 53 percent of the total caseload) have the lowest probability of exit from ODSP and the highest likelihood of re-entry to ODSP. Older age is positively associated with exiting ODSP, but negatively associated with re-entering ODSP. In other words, the youngest (18-24) recipients are less likely to leave the benefits and more likely to return to the benefits than the oldest (45-54) recipients. The higher likelihood of younger cohorts to stay longer on benefits could have important bearing on the caseload growth and program costs.

The duration on ODSP is generally negatively associated with the level of education. In other words, recipients with lowest education (0-8) are less likely to leave the benefits and more likely to return to the benefits. Immigrants leave the benefits much slower but return to the benefits much faster than Canadians at birth. Being single is associated with a slower exit rate and faster re-entry rate. The presence of children results in longer stay on the benefits and shorter stay off the benefits.

Recipients with mental illness and those who are not married account for dominant shares of the censored spells. Since more education is positively associated with the probability of exit, education or retraining programs may be useful for this subgroup. It is also possible that singles may suffer more so from a lack of support structures as compared to couples. If true, they may have higher returns from additional

temporary labour-oriented support services in terms of human capital accumulation, to cross the labour market entry threshold.

The analysis shows clear evidence of association of the recipients' characteristics and duration of ODSP benefits; On-spells (off-spells) tend to be longer (shorter) for those metal disorder who are younger, less educated, single and have children. Heterogeneity of recipients' characteristics and associated probabilities of leaving or re-entering to the ODSP benefits require differentiated, not 'one size fit all', policies and programs, focusing on those who are most likely to exit from ODSP, to facilitate transitions from benefits dependence to economic independence. For instance, younger recipients, skewed toward low education distribution, are much less likely to leave the benefits but much more likely to return to the benefits. The most probable explanation of this phenomenon could be early onset of disability that limits further education and on the job experience opportunities. Therefore, what may be required is customized employment support initiatives such as special training, equipment, and work place accommodations.

The results warrant that improvements in the projection of caseload growth in the ODSP program not only requires a better understanding of recipients' characteristics affecting benefit receipt patterns but also those factors that affect the length of time on/off the disability benefits. The results also suggest that issues related to length of time on/off disability benefits, especially potentially prolonged stays, will be of increasing importance in ODSP policy discussions and call for further research. Further work is needed to investigate the impact of other potential determinants (e.g., labor market conditions, generosity of benefits etc.) of the duration of on-spells and off-spells.

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Table 2.1: Summary Statistics of the Recipients Age 18-54, 2004-2013

Characterisric	Completed Spells		Cencered Spells		Total Spells	
	Mean	SE	Mean	SE	Mean	SE
Disability Type						
Mental Disorder	0.3978	0.0025	0.5603	0.0013	0.5282	0.0020
ADP&Other	0.2092	0.0033	0.2488	0.0015	0.2429	0.0014
Neurotic	0.1588	0.0030	0.1430	0.0012	0.1453	0.0011
Psychoses	0.5542	0.0041	0.4800	0.0017	0.4911	0.0016
Retardation	0.0777	0.0022	0.1282	0.0012	0.1207	0.0010
Musculoskeletal	0.1066	0.0016	0.1201	0.0008	0.1175	0.0007
Nerves and Sense Organs	0.0708	0.0013	0.0739	0.0007	0.0733	0.0006
Circulatory	0.0452	0.0011	0.0355	0.0005	0.0374	0.0004
Infectious	0.0132	0.0006	0.0236	0.0004	0.0215	0.0003
Congenital	0.0285	0.0009	0.0220	0.0004	0.0233	0.0003
Others	0.3379	0.0025	0.1647	0.0010	0.1989	0.0009
Age Group						
18-24	0.1409	0.0018	0.2487	0.0011	0.2274	0.0010
25-34	0.1866	0.0020	0.1895	0.0010	0.1890	0.0009
35-44	0.2704	0.0023	0.2392	0.0011	0.2454	0.0010
45-54	0.4021	0.0025	0.3226	0.0012	0.3383	0.0011
Education						
0 - 8	0.0848	0.0014	0.0987	0.0008	0.0960	0.0007
9 - 11	0.3007	0.0024	0.3555	0.0012	0.3447	0.0011
12 - 13	0.3292	0.0024	0.3346	0.0012	0.3336	0.0011
Post Sec	0.2853	0.0023	0.2112	0.0011	0.2258	0.0010
Family Structure						
Couples without Children	0.0823	0.0014	0.0542	0.0006	0.0598	0.0005
Couples with Children	0.1061	0.0016	0.0774	0.0007	0.0831	0.0006
Singles without Children	0.7025	0.0024	0.7391	0.0011	0.7319	0.0010
Singles with Children	0.1091	0.0016	0.1293	0.0009	0.1253	0.0008
Marital Status						
Never Married	0.4306	0.0026	0.5553	0.0013	0.5307	0.0012
Divorced, Seperated, Widow	0.3616	0.0025	0.3058	0.0012	0.3168	0.0011
Married Com. Law	0.2078	0.0021	0.1388	0.0009	0.1525	0.0008
Number of Children						
None	0.8079	0.0020	0.8270	0.0010	0.8232	0.0009
One	0.0987	0.0015	0.0920	0.0007	0.0934	0.0007
Two	0.0624	0.0013	0.0503	0.0006	0.0527	0.0005
Three Plus	0.0309	0.0009	0.0307	0.0004	0.0307	0.0004
Accommodation						
Rented	0.7678	0.0022	0.8226	0.0010	0.8118	0.0009
Subsidized Housing	0.0957	0.0015	0.1114	0.0008	0.1083	0.0007
Owned	0.1072	0.0016	0.0501	0.0006	0.0186	0.0003
Other	0.0293	0.0009	0.0159	0.0003	0.0614	0.0006
Immigration Status						
Canadians at Birth	0.7734	0.0022	0.7725	0.0011	0.7727	0.0010
Immigrants	0.2266	0.0022	0.2275	0.0011	0.2273	0.0010
Sex						
Females	0.4614	0.0026	0.4753	0.0013	0.4726	0.0012
Males	0.5386	0.0026	0.5247	0.0013	0.5274	0.0012
Time to Exit (Years)	2.4692	0.0110	4.4498	0.0072	4.0587	0.0064
N (%)	37095 (19.75)		150768 (80.25)		187863 (100)	

Notes: First Entrants 2004 to 2013. Characteristics are as of entry. Completed Spells - Recipients who have left during 2004 to 2013. Censored Spells - Recipients still on benefits at the end of 2013.

Table 2.2: Annual Entries by Sex, 2004-2013 (First Entry Only)

Entry Year	Males			Females			Both Sexes		
	Annual Entries	Percent	Entry Rate	Annual Entries	Percent	Entry Rate	Annual Entries	Percent	Entry Rate
2004	7737	7.44	2.28	7198	7.73	2.14	14935	7.95	2.21
2005	7924	7.62	2.32	7402	7.95	2.18	15326	8.16	2.25
2006	9340	8.99	2.72	8925	9.58	2.61	18265	9.72	2.66
2007	9820	9.45	2.85	9192	9.87	2.67	19012	10.12	2.76
2008	9537	9.18	2.76	8784	9.43	2.54	18321	9.75	2.65
2009	10769	10.36	3.12	9586	10.29	2.75	20355	10.84	2.93
2010	10862	10.45	3.14	9489	10.19	2.71	20351	10.83	2.92
2011	10926	10.51	3.15	9378	10.07	2.66	20304	10.81	2.90
2012	11250	10.82	3.22	9644	10.35	2.72	20894	11.12	2.97
2013	10916	10.50	3.11	9184	9.86	2.58	20100	10.70	2.84
Total	99,081	100.00	2.87	88,782	100.00	2.56	187863	100.00	2.71

Note: First Entry - not in receipt of benefits in preceding calendar year. Entry rate - annual entries per 1000 Ontario Population (18-54)

Table 2.3: Completed and Censored Spells by Length of Stay (months) on Benefits, Percent, First Spell Only

Entry Cohort	All Spells	Censored Spells	Completed Spells	Spells by Length of Stay					Avg. Spell Length (months)
				<= 6	7 - 12	13 - 24	25 - 36	36 - 60	
2004	14.06	76.46	23.54	20.57	14.31	24.44	18.58	22.11	22.12
2005	14.43	78.06	21.94	18.89	15.94	23.29	19.10	22.78	22.42
2006	17.20	80.34	19.66	18.19	15.79	23.09	19.64	23.29	22.89
2007	17.90	79.58	20.42	18.39	15.12	24.47	19.35	22.67	22.73
2008	17.25	80.18	19.82	17.65	15.53	21.70	18.97	26.16	23.65
2009	19.16	80.36	19.86	17.62	15.41	20.93	19.25	25.71	23.85
Total/Average	100.00	79.31	20.73	18.52	15.35	22.95	19.15	23.83	22.97

Notes: First Entry - not in receipt of benefits in preceding calendar year

Table 2.4: Recipients who Returned to Benefits after First Exit by Time to Re-entry, First Spell only (percent)

Time to Re-entry (months)	All Exits		Non-death Exits		Returned		Avg. Off Spell Length (months)
	Rate	Share	Rate	Share	Rate	Share	
Panel A: Exited and Returned within Five Years of First Entry, 2004-2009 Entry Cohorts							
2 - 6	3.47	16.7	3.46	17.92	9.49	49.64	3.17
7 - 12	1.59	7.7	1.59	8.22	4.20	21.98	8.48
13 - 18	0.92	4.5	0.92	4.78	2.30	12.05	14.16
19 - 24	0.49	2.4	0.49	2.54	1.11	5.80	20.53
25 - 60	14.26	68.8	12.86	66.54	2.01	10.54	32.84
Total	20.73	100.0	19.33	100.00	19.11	100.00	15.84
Panel B: Exited and Returned any time During 2004 - 2013							
2 - 6	3.13	15.07	3.12	16.16	15.82	48.31	3.15
7 - 12	1.33	6.72	1.33	7.20	6.72	20.53	8.48
13 - 18	0.71	3.60	0.71	3.85	3.60	10.98	14.12
19 - 24	0.34	1.73	0.34	1.85	1.73	5.29	20.68
> 24	14.24	72.12	12.93	70.14	4.88	14.89	41.74
Total	19.75	100.00	18.43	100.00	32.74	100.00	17.64

Notes: Rate - % of total recipients entered for the first time. Share - % of recipients who exited/returned

Table 2.5: Recipients who Returned to Benefits after First Exit by Time to Re-entry, First Spell Only, 2004 and 2009 Entry Cohorts (percent)

Time to Re-entry (months)	2004 Entry Cohort				2009 Entry Cohort			
	Non-death Exits		Returned		Non-death Exits		Returned	
	Rate	Share	Rate	Share	Rate	Share	Rate	Share
2 - 6	3.67	16.80	15.76	45.49	3.09	16.59	16.59	51.43
7 - 12	1.72	7.88	7.14	20.62	1.37	7.36	7.36	22.81
13 - 18	1.35	6.19	5.15	14.87	0.66	3.53	3.53	10.96
19 - 24	0.68	3.10	2.30	6.64	0.32	1.74	1.74	5.40
25 - 60	14.42	66.03	4.29	12.39	13.18	70.77	3.03	9.40
Total	21.84	100.00	34.64	100.00	18.62	100.00	32.26	100.00

Notes: Rate - % of total recipients entered for the first time. Share - % of recipients who exited/returned

Table 2.6: Flexible Parametric Models Estimates - The Effects of Benefit Recipients' Characteristics on the Probability of First Exit, First Spell Only, 2004-2013

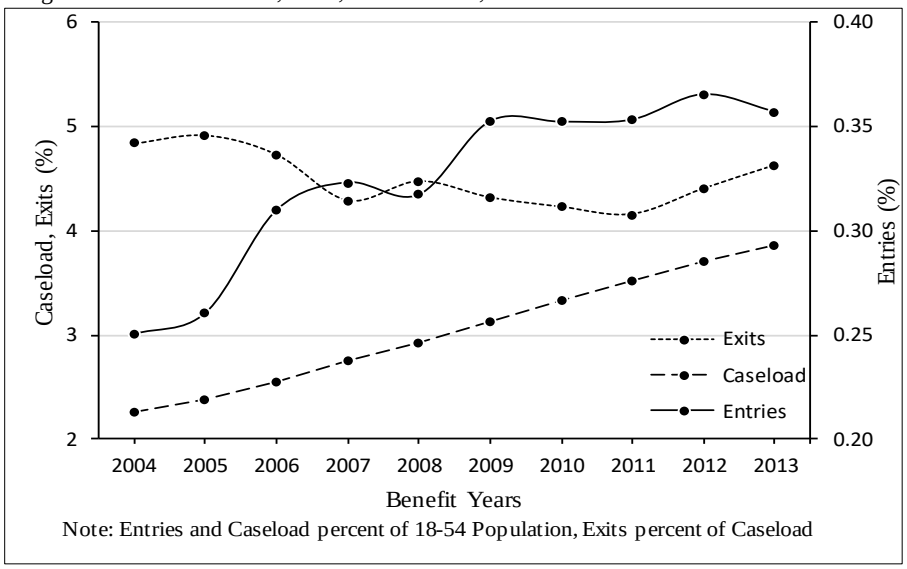
Explanatory Variables	All Exits Types		Non-death Exits Only	
	Hazard Ratio	SE	Hazard Ratio	SE
Disability Type (Other)				
Mental Disorder	0.545***	0.005	0.567***	0.005
Musculoskeletal	0.588***	0.008	0.612***	0.008
Nerves and Sense Organ	0.684***	0.010	0.707***	0.010
Age Group (45 - 54)				
18 - 24	0.765***	0.012	0.857***	0.014
25 - 34	0.937***	0.011	1.011	0.012
35 - 44	0.906***	0.008	0.942***	0.009
Education (Post Sec)				
0 - 8	0.588***	0.007	0.570***	0.007
9 - 11	0.690***	0.008	0.669***	0.008
12 - 13	0.797***	0.009	0.785***	0.009
Marital Status (Common Law, Married)				
Never Married	0.506***	0.014	0.484***	0.014
Divorced, Separated, Widowed	0.694***	0.019	0.679***	0.019
Family Structure (Singles with Children)				
Couples without Children	0.910**	0.028	0.919**	0.029
Couples with Children	0.863***	0.026	0.866***	0.027
Singles without Children	1.197***	0.016	1.166***	0.016
Accommodation (Owned)				
Rented	0.665***	0.009	0.641***	0.009
Subsidized Housing	0.586***	0.010	0.559***	0.010
Other	0.616***	0.011	0.590***	0.011
Immigration Status (Immigrants)				
Canadian at Birth	1.204***	0.012	1.178***	0.012
Sex (Females)				
Males	1.097***	0.008	1.077***	0.008

Exponentiated coefficients (HR), * p<0.05, ** p<0.01, *** p<0.00, N = 329656

Table 2.7: Flexible Parametric Models Estimates - The Effects of Recipients' Characteristics on the Probability of Re-entry,1st Non-death Off Spell

Explanatory Variables	No Time Varing Effects		Time Varing Effects	
	Hazard Ratio	SE	Hazard Ratio	SE
Disability Type (Other)				
Mental Disorder	1.328***	0.037	1.331***	0.100
Musculoskeletal	1.135**	0.047	1.084	0.126
Nerves and Sense Organ	1.151**	0.050	1.254	0.147
Age Group (45 - 54)				
18 - 24	1.741***	0.077	1.436**	0.168
25 - 34	1.411***	0.050	1.276*	0.124
35 - 44	1.268***	0.038	1.114	0.089
Education (Post Sec)				
0 - 8	0.883**	0.035	0.870	0.095
9 - 11	1.127***	0.038	1.146	0.102
12 - 13	1.080*	0.036	1.057	0.096
Marital Status (Common Law, Married)				
Never Married	0.692***	0.039	0.627***	0.083
Divorced, Separated, Widowed	0.884*	0.049	0.789	0.103
Family Structure (Singles with Children)				
Couples without Children	0.816**	0.059	0.755	0.144
Couples with Children	0.801**	0.057	0.855	0.158
Singles without Children	1.010	0.044	1.088	0.130
Accommodation (Owned)				
Rented	1.038	0.045	1.198	0.151
Subsidized Housing	1.021	0.055	1.372*	0.202
Other	0.863**	0.047	1.089	0.168
Immigration Status (Immigrants)				
Canadian at Birth	0.954	0.031	0.976	0.081
Sex (Females)				
Males	0.937**	0.023	0.937**	0.023
Exponentiated coefficients (HR), * p<0.05, ** p<0.01, *** p<0.00, Outcome - Re-entry, N = 74654				

Figure 2.1: Annual Entries, Exits, and Caseload, 2004-2013



Note: Entries and Caseload percent of 18-54 Population, Exits percent of Caseload

Figure 2.2: Non-Parametric (Kaplam-Meier) Hazard Functions by Entry Cohorts

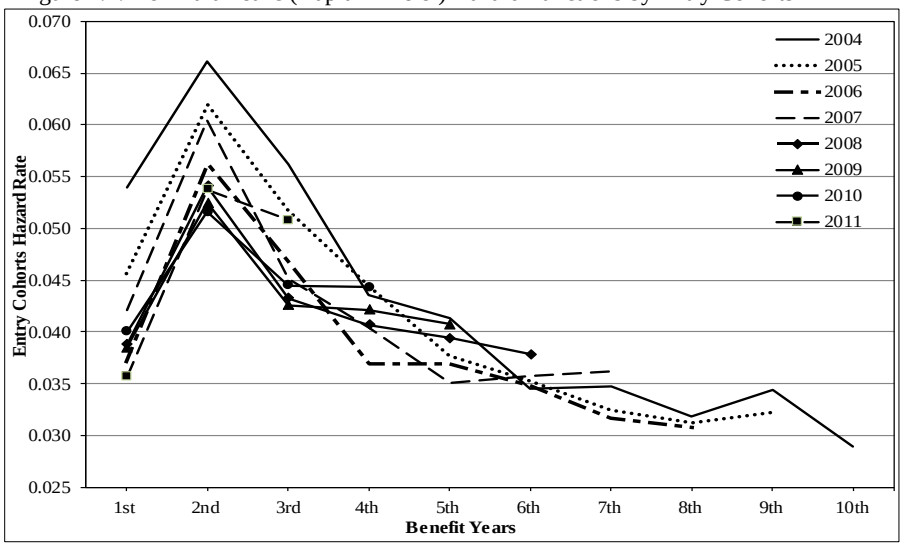


Figure 2.3: Non-Parametric (Kaplam-Meier) Cumulative Hazard Function

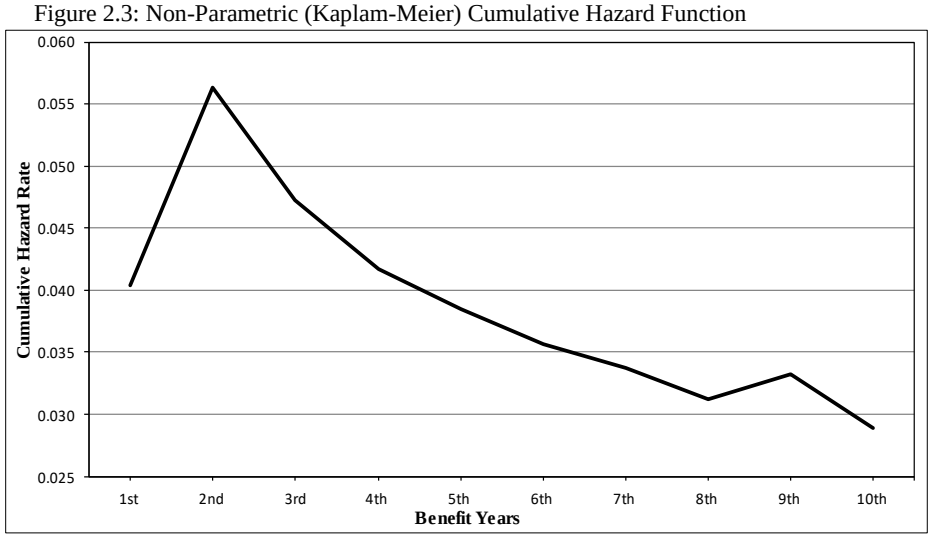


Figure 2.4.1: Kaplan-Meier Survival Functions by Recipients' Characteristics

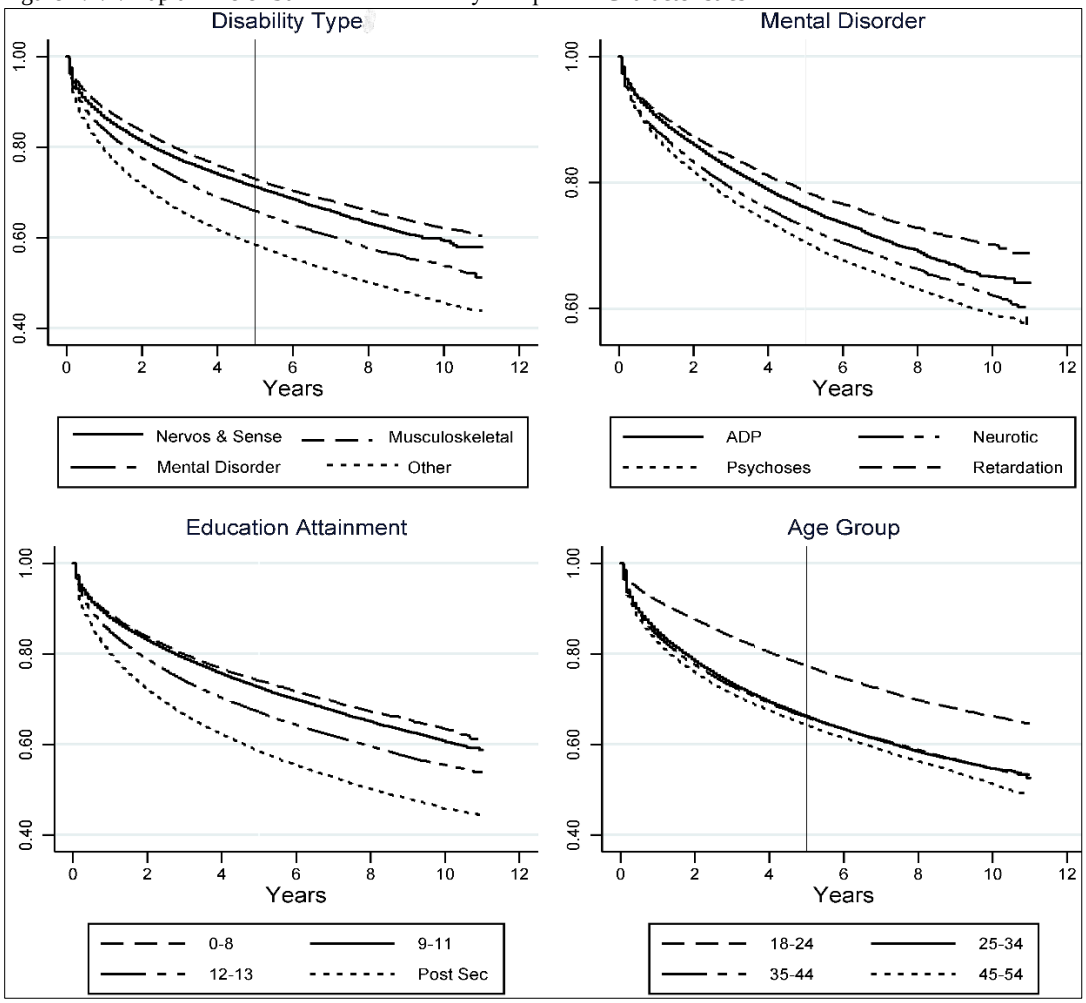


Figure 2.4.2: Kaplan and Meier Survival Functions by Recipients' Characteristics

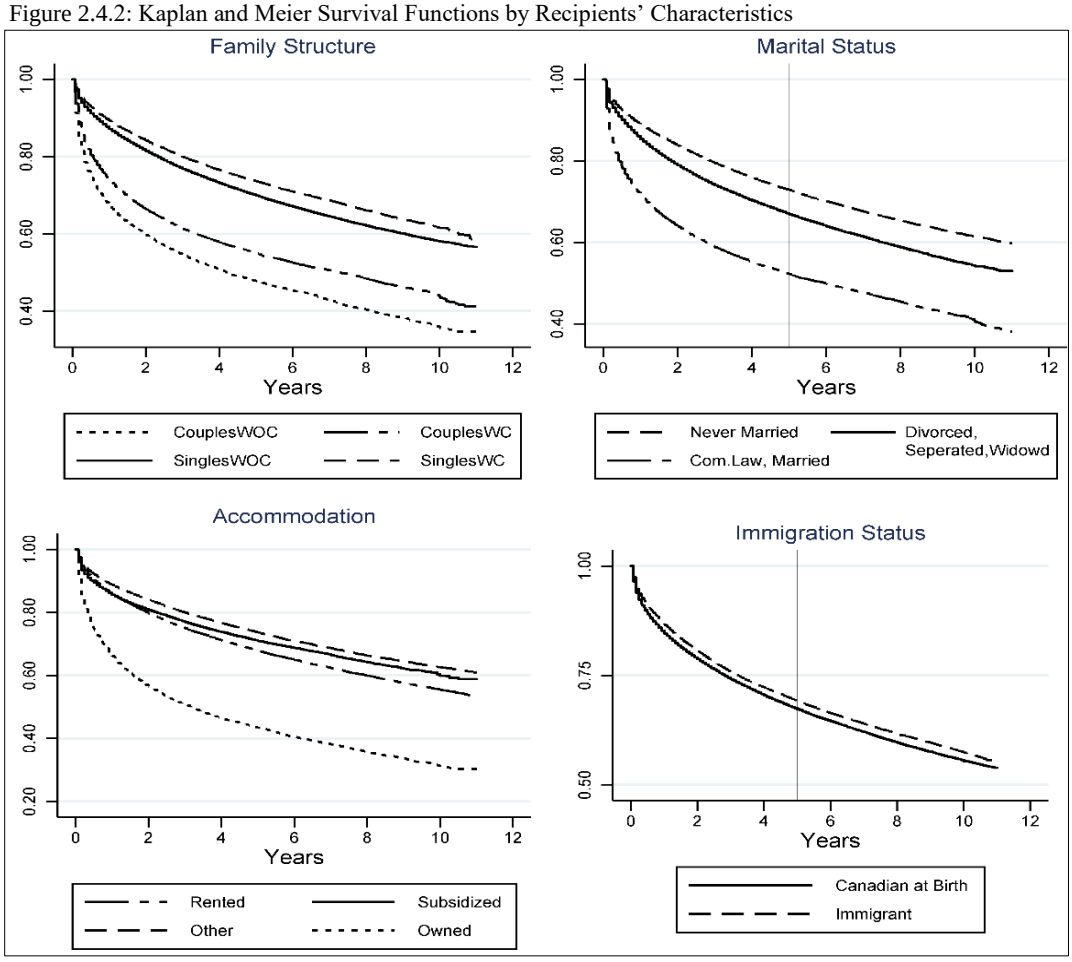
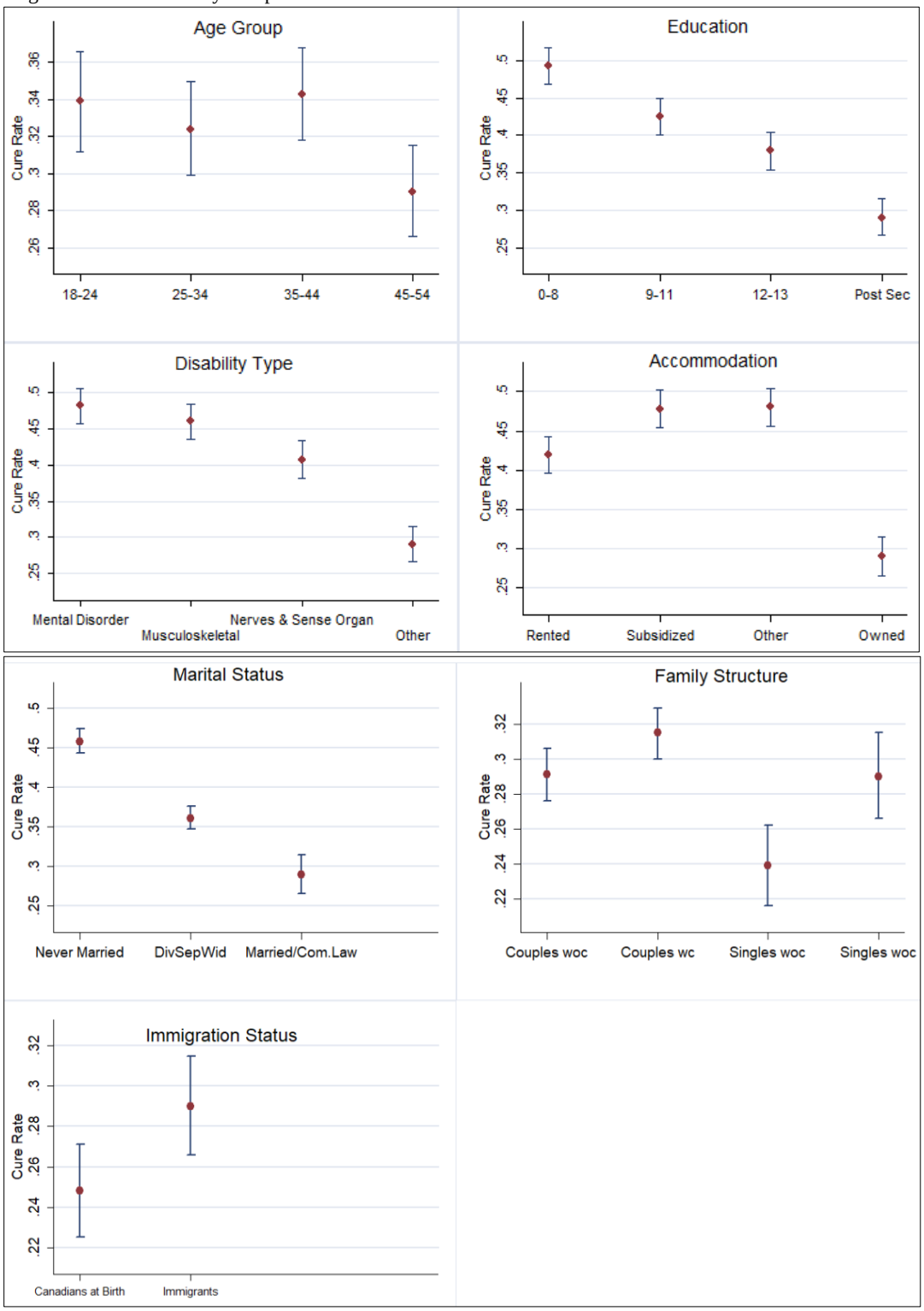


Figure 2.5: Cure Rates by Recipient Characteristics



Appendix II

Table A1: Completed and Censored Spells by Length of Stay (months) on Benefits, Percent

Number of Spells/Entry Cohort	Total Spells	Censored Spells	Completed Spells	Spells by Length of Stay					Avg. Spell Length (months)
				<= 6	7 - 12	13 - 24	25 - 36	36 - 60	
Panel A: First Entry, 2004 to 2009 Entry Cohorts (1st Spell Only)									
2004	14.06	76.46	23.54	20.57	14.31	24.44	18.58	22.11	22.12
2005	14.43	78.06	21.94	18.89	15.94	23.29	19.10	22.78	22.42
2006	17.20	80.34	19.66	18.19	15.79	23.09	19.64	23.29	22.89
2007	17.90	79.58	20.42	18.39	15.12	24.47	19.35	22.67	22.73
2008	17.25	80.18	19.82	17.65	15.53	21.70	18.97	26.16	23.65
2009	19.16	80.36	19.86	17.62	15.41	20.93	19.25	25.71	23.85
1st Spell	100.00	79.31	20.73	18.52	15.35	22.95	19.15	23.83	22.97
Panel B: First Entry, 2004 to 2013 (All Spells)									
First Spell Only	95.32	80.54	19.75	18.18	14.23	19.94	14.75	31.45	29.63
Multiple Spells	4.68	62.66	38.00	47.06	14.24	15.55	9.25	12.16	2.12
All Spells	100.00	79.71	20.60	20.67	14.23	19.56	14.27	29.78	27.26

Notes: First Entry - not in receipt of benefits in preceding calendar year

Table A2: Flexible Parametric (RP) Cure Models Estimates – The Effects of Benefit Recipient Characteristics on the Probability of First Exit

Explanatory Variables	All Exits		Non-death Exits	
	Hazard Ratio	Std.err	Hazard Ratio	Std.err
Disability Type (Other)				
Mental Disorder	0.591***	0.0049	0.610***	0.0053
Musculoskeletal	0.631***	0.0078	0.653***	0.0084
Nerves and Sense Organ	0.736***	0.0096	0.755***	0.0103
Age Group (45 - 54)				
18 - 24	0.838***	0.0123	0.955**	0.0145
25 - 34	0.915***	0.0100	1.001	0.0114
35 - 44	0.880***	0.0078	0.919***	0.0085
Education (Post Sec)				
0 - 8	0.614***	0.0068	0.591***	0.0068
9 - 11	0.700***	0.0077	0.677***	0.0077
12 - 13	0.793***	0.0087	0.779***	0.0088
Marital Status (Common Law, Married)				
Never Married	0.624***	0.0177	0.598***	0.0174
Divorced, Separated, Widowed	0.818***	0.0230	0.800***	0.0231
Family Structure (Singles with Children)				
Couples without Children	1.006	0.0316	1.016	0.0327
Couples with Children	0.950	0.0293	0.956	0.0302
Singles without Children	1.169***	0.0146	1.132***	0.0147
Accommodation (Owned)				
Rented	0.700***	0.0094	0.674***	0.0093
Subsidized Housing	0.609***	0.0101	0.578***	0.0100
Other	0.599***	0.0100	0.570***	0.0099
Immigration Status (Immigrants)				
Canadian at Birth	1.167***	0.0114	1.138***	0.0115
Sex (Females)				
Males	1.096***	0.0082	1.076***	0.0084

Exponentiated coefficients (HR), * p<0.05, ** p<0.01, *** p<0.00, N = 329656

Chapter 3

Immigrant Use of the Ontario Disability Support Program: A Duration Analysis

3.1 Introduction

The impact of markedly growing immigrant populations is debated in many developed countries, but the experience of this impact has differed across countries. In Canada, the use of welfare benefits by immigrants has rarely been politicized (Koning 2012) and Canadian immigration policy has been seen as largely successful compared to that in many European countries. This success is largely attributed to the selection process used in Canada that presumably admits immigrants in better health, with high productivity and skill levels, which enables immigrants to adapt more rapidly to the labor market and contribute to the economic wellbeing of the country. Immigrants' contribution compared to the fiscal burden they cause is the subject of much disagreement among economists (see Akbari 1989; Razin et al. 2011; Javdani and Pendakur 2014; Grubel and Grady 2011; Grubel 2016). Advocacy for relatively more or less open immigration policies inevitably must account for the marginal benefits and costs of such policies to the host country. One aspect of the public costs of immigration is the immigrants' use of public support programs including disability benefits. This paper looks at how immigration status is associated with benefit receipt for the Ontario Disability Support Program (ODSP), which is a public support program for Canada's most populous province. No previous analysis of this question has been undertaken in Canada.

We find that age is an important factor to consider when investigating benefit receipt by immigration status; benefit receipt for immigrants is more strongly dependent on age than that for the Canadian-born. Older immigrants are more likely to receive disability benefits relative to the Canadian-born, with the reverse being true for younger age groups. Although the interaction of age with immigration benefit receipt has been documented in several international studies, this is the first study that examines the relationship of this interaction with the exit rate from benefit receipt in Canada. We do so using duration analysis methods. We

find that the exit rate near retirement differs strongly between immigrants and non-immigrants which is an important component of differential ODSP receipt rates across age.

Ontario has the highest concentration of immigrants among Canadian provinces. In 2016, 31% of the population was immigrant (defined as non-citizen foreign-born), compared to the national average of 23%.[30] The immigrant segment of the Ontario population has been growing markedly. For instance, it has increased from 3.0 million to 4.1 million at an average growth rate of 2.7% annually between 2001 and 2016. Further, the rapidly growing Ontario immigrant population is also increasing the share of older immigrants (55 and older). For instance, between 2001 and 2016 the proportion of immigrants aged 55 and older in Ontario has increased from 35.1% to 42.3% at an average annual growth of 1.7%. This could happen for two reasons. First, younger immigrants who arrived earlier are getting older over time. Second, new immigrants may be arriving at relatively older ages (e.g., especially refugees and family class immigrants).

Such shifts in the population distribution of immigrants inevitably translate into health-related pressures on the public sector, including disability support programs. Understanding such demographic pressures on the ODSP is essential to ascertaining its ongoing financial viability. For example, during the last decade the caseload of ODSP increased from 213 to 286 per 10,000 population 18 and older, an average of 5% per year.[31] ODSP spending for 2016-17 is estimated to be about $5.1 billion as compared to $2.9 billion (in 2017 constant dollars) in 2003-04; an increase of 4.1% per year and accounts for 3.3% of provincial expenditures.[32] To the best of our knowledge, there is no study that focuses on immigrant use of ODSP benefits; how the age at entry into ODSP and the age at arrival to Canada affects the use and duration of disability benefits of immigrants at the individual level. This is an important gap in the literature. We present

[30] Statistics Canada Census Program, Data Products, 2016, http://www12.statcan.gc.ca/census-recensement/2016/dp-pd/hlt-fst/imm/Table.cfm?Lang=E&T=11&Geo=00&SP=1&view=2&age=1&sex=1
[31] Social Assistance Statistical Report 2009-13.
[32] Ontario Ministry of Finance Budget Estimates, https://www.fin.gov.on.ca/en/budget/estimates/2004-05/volume1/MCSS.pdf and https://www.ontario.ca/page/expenditure-estimates-ministry-community-and-social-services-2016-17.

several results of interest. We find the Canadian-born have a much higher benefit receipt rate than immigrants at younger (18-34) and middle ages (35-54), but the benefit receipt rates of Canadian-born decline at a much faster rate as they near retirement age, and after a cross over point they become lower than the benefit receipt rates of immigrants at older ages (55 and over).

The remaining is organized as follows. Section 3.2 provides a review of existing literature. Section 3.3 describes the administrative data and provides key definitions. ODSP descriptive statistics are presented in section 3.4. The empirical methods and estimation strategy are presented in section 3.5, followed by a presentation of the results in section 3.6. Section 3.7 concludes with a summary and a discussion of policy implications.

3.2 Literature Review

Several studies focus on immigration participation in welfare programs, which are related to disability programs, in the US and Europe. The findings in the US literature are mixed. For instance, Blau (1984), Tienda and Jensen (1986), and Jensen (1988) found immigrants to be less likely than natives to receive welfare benefits whereas Borjas (1994) and Borjas and Hilton (1996) found the reverse. Borjas and Trejo (1991) found that immigrants' use of welfare increased with time in the U.S. Borjas (2002) and Kaestner and Kaushal (2005) reported that immigrants' use of welfare decreased after the 1996 welfare reform (i.e., exclusion of non-citizens from the majority of means-tested assistance programs because of reduced eligibility).

Brucker et al. (2002) examined the impact of immigration status (called the "immigrant effect") on the welfare receipt rates in 11 European countries. Again, the findings were mixed. In some countries (e.g., Germany, the UK, Greece, Spain and Portugal) immigrants had similar or even lower benefit receipt rates than the native population, whereas in other countries (Denmark, the Netherlands, Belgium, France, Austria and Finland) immigrants had markedly higher benefit receipt rates than the native population. Several other European studies (e.g., Castronova et al. 2001; Hansen and Lofstrom 2003 and 2006; Nannestad 2004,

Riphahn 2004; Barrett and McCarthy 2008; Andren and Andren 2013; Wunder and Riphahn 2014) found an "immigrant effect", but the difference in the welfare receipt rates between immigrants and natives was largely explained by immigrants' characteristics.

There are related studies in Canada that have similarly focused on immigration and social assistance. Baker and Benjamin (1995) was the first study to investigate the use of both Employment Insurance (EI) and Social Assistance (SA) by immigrants in Canada and found that immigrants were not any more likely to use these programs than native-born. However, a later study that used a longer time frame questioned the robustness of these results (Crossley, McDonald, and Worswick, 2001). Ostrovsky (2012) adopted an entry cohort approach using Canadian administrative data from 1993 to 2007 to investigate the use of EI and SA of immigrants. The study found no evidence of differences between native-born and immigrants, as well as across immigrant cohorts, in the use of EI and SA. In a recent study, Lu, Frenette, and Schellenberg (2015) show that there are considerably higher rates of SA receipt among refugees, particularly recent refugee claimants, than Canadian-born.

Other studies find that recently arrived immigrants are less likely to receive disability benefits, which has been attributed to a "the healthy immigrant effect" and sponsor responsibilities for family class immigrants. That is, relatively healthier immigrants are admitted into Canada. The health of immigrants has always been at the forefront of Canadian immigration policy (Jasso et al. 2004; Chiswick, Lee, and Miller 2008; El-Lahib and Wehbi 2011).[33] Some Canadian studies find that recent immigrants are healthier than those who arrived at least 10 years earlier and Canadian-born (Gushulak 2007; Kim et al. 2013); their prevalence of poor health is estimated to be about 7.5 percentage points lower average. For instance, Beiser and Hou (2014) find recent younger immigrants are about 15 percentage points less likely to have had at least one

[33] See Kennedy et al., (2014), Newbold and Danforth (2003), McDonald and Kennedy (2004), Ng et al. (2005), Wu and Schimmele (2005), Veenstra (2009), Robert Vineberg (2015), and Vang et al. (2015) for details of Canadian immigration health policy and the healthy immigrant effect.

physical condition than older immigrants and Canadian-born, and that only 3.2% of recent immigrants had at least one mental health condition compared to 7.9% of older immigrants and 11.1% of Canadian-born.

Although recent immigrants are generally healthier and less likely to receive disability benefits, the risk of being disabled and receiving disability pension increases with time in the host country (Hammarstedt 2000; Osterberg and Gustafsson 2006). In Canada, it has been documented that immigrants' relative health deteriorates with time in Canada and converges to the average health of the Canadian-born population (Globerman 1998, Newbold and Danforth 2003). In aging societies like Canada, increasing age related health difficulties of the elderly can have a marked impact on the demand for and costs of public disability support programs.

Immigrants who arrive at older ages are also more likely to use welfare programs (Hu 1998). This has been attributed to lack of cultural flexibility, whose effects may be exacerbated with the risk of isolation from family members and the community (Pumariega et al. 2005), limited English proficiency, age-related financial strain (Sadarangani and Jun 2015), and economic outcomes (Picot and Sweetman 2005; Picot et al. 2017; Begin, Goyette and Riddell 2011; Bastien and Belanger 2013). The deteriorating health of earlier immigrants and the poor health of those immigrants who arrive at older age all adds to the already rapidly growing segment of Ontario population with disabilities.

The difference between the benefit receipt rates of Canadian-born and immigrants at younger and middle ages (18-54) can be largely explained by the healthy immigrant effect. Whereas, the wedge in disability benefit receipt rates of Canadian-born and immigrants at older ages can be largely attributed to differentials in their eligibility for, and expected income from, alternative benefit programs such as Canada Pension Plan (CPP) pension, Old Age Security (OAS) pension and Guaranteed Income Supplement (GIS). Most older immigrants especially the immigrants who have arrived at older age, even after reaching the OAS age (65), generally are not likely to qualify for OAS benefits since one must live in the country for 40 years to receive full OAS, or at least 10 years to receive partial benefits in proportion to the number of years of residence. While most older immigrants tend to rely on GIS (Marier and Skinner 2008), the reliance increases with

age (Finnie, Gray and Zhang 2012), older recent immigrants receive neither OAS nor GIS benefits (Baker, Benjamin and Fan 2009; Kaida and Boyd 2011). These eligibility requirements typically have no impact on Canadian-born recipients therefore the ODSP benefit receipt rate of Canadian-born declines at much faster rate as they near the retirement age. Moreover, immigrants generally have much shorter working histories than Canadian-born therefore they may not have yet contributed enough toward CPP as they near the retirement age that results in much lower CPP benefits.

Many studies (e.g., Hu 1998; Barrett and McCarthy 2008) have shown that households with members over the age of 65 are more likely to be on welfare. Given the age differences in eligibility requirements and labor market prospects, a separate analysis of the determinants of welfare participation on the part of older people is called for. The heat of the debate over the economic costs of immigration policy around the globe has sparked the development of a sizeable literature in Canada but the focus has been on welfare use of immigrants that is informative on several accounts. However, surprisingly no research has been done on ODSP use of older immigrants and how the age at entry into the benefits and the age at arrival to Canada affects the use and duration of disability benefits of immigrants.

3.3 Data Description and Key Definitions

Since its inception in 1997, ODSP has provided income and employment support to persons with a disability who are 18 and older, with special emphasis on gaining employment. [34] Applicants are subject to residency, income/asset, and disability tests. They must be residents of Ontario, and must need financial support (i.e., have little or no other source of income and assets worth not more than $40,000). Further, they must have substantial mental or physical impairment that is expected to last for one year or longer. The impairment is considered substantial if it restricts the ability of applicants to care for themselves, function in the community, or work. ODSP, unlike social assistance, has no mandatory work requirements or time limit for benefits receipt.

[34] The rule of age 18 or older is subject to certain exceptions.

We use ODSP administrative files from 2003 to 2013. The data files contain monthly records of the amount and type of disability benefits received, along with information on demographic and related characteristics of recipients, including sex, age, marital status, number of children, education, accommodation, and underlying health condition. Of particular note, the file also records birth place as either Canadian-born or foreign-born. This binary categorization is the primary explanatory variable of interest in this study. Although, not part of our primary regression analysis which relies on individual-level data, we also make use of aggregate Statistics Canada census data to calculate the caseload and entry rates separately for the Canadian-born and immigrant populations.

The administrative data provide a rich set of covariate information which may help to explain immigrant use of ODSP. This includes age, age at entry into the benefits and, of particular interest for our purposes, age at immigration.[35] We focus on first spell only and follow benefit recipients until they exit from benefit receipt or to the end of the data period, whichever comes first. Age varies over this time, but we consider age at time of entry only; hence it is treated as time-invariant. We specify age at entry into benefits as a categorical variable to allow ease of interpretation and flexibility for capturing non-linear effects; the six age groups are: 18 - 24, 25 - 34, 35 - 44, 45 - 54, 55 - 64, and 65 and older. Age at arrival in Canada is also treated as a categorical variable and is classified into eight groups: 17 and younger, 18 - 24, 25 - 34, 35 - 44, 45 - 54, 55 - 64, 65 and older, and unknown. As the substantive focus of this paper is on older immigrants, we also make use of single years of age for ages 55 and over. For all analyses, we exclude benefit recipients under the age of 18.

Annually, a targeted number of immigrants selected from a pool of applicants is admitted into Canada in four different categories: economic class; family class; refugees; and others. Economic class accounted for about 60% of the 2016 total intake; it includes skilled workers (Federal and Quebec), skilled trades workers, Canadian experience class, caregivers, investors, self-employed and entrepreneurs, and provincial and

[35] While the age of onset of disability is an aspect worth considering as a determinant of disability benefit take up or exit, this information is not available.

territorial nominees. Each principal applicant may be accompanied by their spouses, partners and children. Family class, also known as sponsored immigrants, is the second largest category of immigrants; it accounted for about 30% of the 2016 total. This category is mainly comprised of spouses, partners and children of settled immigrants or the Canadian-born. Refugees include foreign nationals who are fleeing from persecution, torture, and death threats for reasons of race, religion, nationality etc., and those seriously affected by civil war or armed conflicts or who have suffered human rights violations and need protection in Canada. The remaining category, Others, accounts for only about 1% of the total; it includes those who do not qualify for the other categories but who are granted permanent residency based on special circumstances such as a public policy case and humanitarian and compassionate grounds.

The demand for ODSP benefits is expected to vary across different immigration categories. For instance, economic class immigrants are expected to have better health, higher education and skill levels, and greater cultural and labor market adaptability than refugees and family class immigrants. Hence, they should be less likely to rely on disability benefits. The immigrant category is recorded at the time of arrival in Canada and is distinct from current citizenship status. Our measures of both relate to the time of entry into receipt of benefits.

Another primary factor expected to influence the use of ODSP is, of course, the medical classification of disability types. For instance, people with cognitive and mental disorder face greater employment challenges than people with sensory and other physical disabilities (Arim 2015), and therefore are less likely to exit ODSP. Moreover, people with more severe disabilities have significantly worse employment prospects than those with less severe disabilities (Turcotte 2014); according to the Canadian Survey on Disability 2012, only 12% of people with disabilities were employed. This employment level ranged from 18.6% to 12% to 9.6% for people with mild, moderate and severe disabilities, respectively. The type, nature and severity of disability vary by sex and across age groups. Disability increases with age (Cai and Gregory 2003), and younger recipients are more likely to exit (Buddelmeyer 2001). Moreover, older workers with

poor health tend to retire early (Anderson and Burkhauser 1985; Sickles and Taubman 1986; Bound 1991; Bound and Waidmann 1992; Loprest et al. 1995; Dwyer and Mitchell 1999; and Campoleiti 2002).

In the administrative data, disability type is classified using the International Classification of Diseases, 9th revision (ICD 9) codes. In this coding system, disability types fall into 17 broad clinical categories.[36] We reclassify them into eight: Mental Disorders: Musculoskeletal Disorders; Nervous System / Sense Organ Disorders; Circulatory Disease; Infectious Diseases; Congenital Disorders; Other; and Unknown. The first six categories are presented from largest to smallest based on the number of recipients in the dataset, while "other" combines the remaining 10 disability categories (each of these represents less than 3% of recipients).[37]

Marital status may also have an impact on benefit use and thus be an important control variable. For instance, we anticipate that those married or living common law are less likely to receive and more likely to exit disability benefits due to excess income or assets, as compared to divorced, separated or widowed. We classify marital status into three categories: Never Married; Divorced, Separated, and Widowed; and Legal Common Law and Married. The presence and number of children may also have an impact on exit from benefits. It is commonly believed that singles with children are less likely to exit than couples with or without children. To this end, four dummy variables are created to represent this additional aspect of family structure: no children, one child, two children and three or more children.

Many studies find exit from benefits to increase in education (e.g., O'Neill et al. 1987; Blank 1989; Fortin and Lacroix 1997; Barrett 2000; Barrett and McCarthy 2008); we have classified the level of educational attainment into four groups: middle school (0-8), some high school (9-11), high school completed (12-13), and some postsecondary, as reported at the time of first benefit receipt.

[36] http://icd9.chrisendres.com/index.php?action=contents

[37] This ensures that MCSS requirements relating to minimum cell size for disclosure are satisfied.

Pudney (2010) finds that older home-owners are less likely than older renters to claim disability benefits (specifically, the so-called Attendance Allowance) in the UK. Thus, the impact of accommodation type on the length of time on ODSP may be important. For instance, an increase in earned income exemptions is more attractive for those in rental or owned accommodation than those living in subsidized housing. That suggests that there is less incentive for those in subsidized housing to participate in the labour market and hence to exit disability benefits. To account for the accommodation differences, we have classified the sample into four groups: Subsidized Housing, Rented, Owned, and Other Accommodation. The last category includes boarding and lodging, nursing homes, and community resource centers, each of which accounts for only a small proportion of recipients.

The data file also includes information on dates of entry into and exit from ODSP, but identification of exact entry and exit dates is complicated by data definitions, rule changes, and censored observations. We use approval date as the date of entry rather than application date; we thereby avoid inconsistencies in the record as well as having to account for differences in the waiting period during which some form of coverage through Ontario Works is usually provided.[38] Importantly, the policy on the payout relating to the time from application to approval (i.e., the waiting period) changed in September 2006 when the "4-month rule" was revoked. It stipulated that the extra payout related to disability benefits in the waiting period would cover a maximum of four months. The calculation of wait time related reimbursement would therefore need to cover the difference in benefits expected between the two programs (based on complicated formulas involving income, family structure, etc.).[39]

Identification of exits is complicated due to data definitions related to recipient status. For instance, benefits may be suspended temporarily (for a period that may be up to one year), yet the status ('active') and termination reason ('continue') remain unchanged in the data record throughout this period even though the recipient does not receive any benefits. We therefore make use of the payment record to define exit and

[38] The distribution of wait times is presented in Appendix I, Figure A3.
[39] Disability benefits are much higher (over 70 %) than base welfare rates (John et al., 2014).

any subsequent re-entry based on breaks in benefit payments. By our definition, an exit from benefits occurs if there is a break of at least two consecutive months in benefit payments. This "two months" rule is an approach commonly used to define spell/exit.[40] A common view supported by the existing literature is that a shorter absence from payment, say one month, may not represent a true exit because such a break could have resulted for administrative reasons such as missing information, non-compliance, etc.

Since the behaviour of benefit recipients may differ after a first entry into ODSP, we focus much of the analysis on "first spells".[41] However, identifying this subset in a manner that is consistent across time is complicated by the left censoring problem. That is, for benefit recipients entering in 2013, we have a 10-year history of previous spells, but for those in 2004 we see only one year. Thus, we define "first spell" (henceforth "first entry" or just "first spell") to include individuals in receipt of benefits in one calendar year, whether, say, 2004 or 2013, but not in the preceding calendar year, 2003 or 2012. This makes our definition consistent across time and avoids artificial trends associated with the observed first spell.

Although this definition of first entry or first spell eliminates the bias over time due to left-censoring, it introduces measurement error, since some first entrants according to our definition will not be true first entrants. To get a sense of how large this may be, we validate our first spell definition using the 2013 entry cohort (individuals who entered in 2013 calendar year) by observing their history back to 2003. This allows us to count the number of 2013 entrants who have had received benefits in the prior 10 years and hence were not truly first entrants. We find that only 6 % of the 2013 entry cohort (i.e., those with no receipt of benefit in 2012) had previously been on ODSP sometime between 2003 and 2012. Thus, our definition of first spell captures a large proportion of genuine first spells, and the measurement error appears to be limited.[42]

[40] For instance, Dooley and Stewart (1999) and Barrett (2000).
[41] Important multiple spells descriptive are provided in Appendix III.
[42] See Figure A4 in appendix I.

3.4 Descriptive Analysis

In this section, we examine trends in ODSP benefit receipt (caseload) and transition rates (entries and exits) to provide context to the benefit use of Canadian-born and immigrants and to motivate our empirical strategy. Table 3.1 presents basic descriptive statistics for the both Canadian-born and immigrant recipients; the Canadian-born and immigrants account for about 70% and 30% of the caseload respectively.

The average age at the time of entry into ODSP is 42.6 for the Canadian-born but about 10 years older for immigrants. Immigrants also tend to be overrepresented at older ages, perhaps suggesting that older immigrants are more likely to enter and/or less likely to exit from benefits as compared to Canadian-born.

Immigrant and Canadian-born recipients differ markedly in two disability types. First, mental disorders account for about half of Canadian-born recipients but only one-third of immigrant recipients. Most of this difference relates to the subcategory alcoholic, drug and personality disorder for which the proportion of Canadian-born is double that of immigrants. Second, a large proportion of immigrant recipients, 22%, is categorised in the Unknown disability type, as compared to 10% for the Canadian-born recipients. We note that most of the immigrants in this category are of older age (see Figure 3.6).

Immigrant and Canadian-born recipients also differ in educational attainment; immigrants are overrepresented by about 10 percentage points in both the lowest (less than 9 years of schooling) and highest (at least some postsecondary) categories and underrepresented in the high school dropout category (9 to 11); that may reflect both the educational attainment of the immigrant population more broadly as well as the notably older age of immigrant benefit recipients. Finally, we see that Canadian-born recipients are more (88% verses 75%) likely to be on disability benefits if they are single - never married, divorced, separated, and widowed – as compared to immigrant recipients, that immigrant recipients are slightly more likely to have children and live in subsidised housing, and that males make up a slightly higher proportion among the Canadian-born than among immigrant recipients.

Table 3.2 presents descriptive statistics for variables specific to immigrants. At the time of entry into benefits, 59% of immigrant recipients had become citizens, 31% were permanent residents, and 9% were refugees or refugee claimants. However, classified in terms of immigration categories at the time of arrival in Canada, 33% were in the "other" category and 29% in the family class.

3.4.1 Trends in Benefit Receipt and Transition Rates

Before turning to our main empirical analysis in the next section we provide information about trends in ODSP benefit receipt (caseload) and transition (exit/entry) rates. The rates are shown in Figure 3.1, separately for Canadian-born and immigrants. The caseloads for both groups have increased gradually between 2004 and 2013; for Canadian-born 2.5% to 3.2% and for immigrants 1.3% to 1.9% of the Ontario population. Taking all recipients together, Figure 3.1 shows that the increase in cross-sectional receipt rates (top left panel) reflects an upward trend in entry rates (the top right panel) and a downward trend in exit rates (bottom left panel). The entry rates are slightly higher for Canadian-born than for immigrants; the exit rates are higher for immigrants. That is, the Canadian-born are more likely to enter and less likely to exit, compared to immigrants, resulting in higher caseload rates for the Canadian-born.

As the focus of this paper is on the ODSP behaviour of older immigrants, Figures 3.2, 3.3, and 3.4 illustrate how benefit receipt, entry and exit rates of immigrants differ from the Canadian-born for different groups of age at entry into benefits.

From Figure 3.2, we see that the Canadian-born have a much higher benefit receipt rate than immigrants at younger (18-34) and middle ages (35-54) but a lower rate at older ages (55 and over) .[43] The differences between the age-benefit receipt profiles of the Canadian-born and immigrants result from differences in inflows and outflows across the age span.

[43] The share (%) of Canadian-born and immigrant recipients relative to the caseload is presented in Appendix III, Figure A1.

Entry rates (inflows) by age group are presented in Figure 3.3. Canadian-born are much more likely than immigrants to enter benefits at younger ages (18-34) and much less likely to enter at older ages (65+). For example, in 2004 0.24% of younger Canadian-born compared to only 0.02% of those older entered benefit receipt. In contrast, the entry rate of older immigrants, 0.20%, was much higher than that of younger immigrants, 0.13%, and, especially, of older Canadian-born.

Again, a plausible explanation of these differences in the entry rates between immigrants and the Canadian-born at younger ages could be the 'healthy immigrant effect': that recently arrived immigrants are relatively healthy is, in part, a result of the selection process of Canadian immigration policy. The difference at older ages may be partly attributable to the age at arrival in Canada. Immigrants, who arrive at older ages, generally tend to lack skills (e.g., educated, language proficiency, adaptability, flexibility) required to adapt to the Canadian labor market and culture (see Schaafsma and Sweetman 2001 for details).[44] Moreover, cultural inflexibility combined with isolation from family members and the community may increase the risk of mental health issues**.** Because we lack the individual level data needed to predict entries, we cannot perform regression analysis to control for important observable factors that may help to explain the differences in entry rates. We can, however, perform such analysis for exit rates; we do that after first presenting some descriptive information.

Exit rates (outflows) of Canadian-born and immigrant recipients by age at entry into benefits are presented in Figure 3.4. We see that younger (18-34) Canadian-born recipients are much less likely than immigrants to exit benefits whereas those older (55-64 and 65+) are much more likely. Of note, the exit rate of the Canadian-born increased at older ages over the data period whereas that of immigrants decreased. A plausible partial explanation of the pronounced differences at older ages is that the Canadian-born would have greater eligibility for and expected income from alternative benefit programs such as CPP, OAS and GIS. Immigrants who arrived at older ages would not qualify for full benefits from these other sources;

[44] See Table 1A in appendix III for education attainment of immigrant recipients across age-groups.

hence they would have less incentive to exit ODSP benefits. These eligibility requirements typically have no impact on Canadian-born and therefore their exit rate would be expected to increase as they near retirement age.

As mentioned before there are important differences in the education attainment (skills) of the Canadian-born and immigrants. Immigrants who arrived at older ages tend to be markedly less well educated than those who arrived when younger. Figure 3.5 illustrates the trends in the share of immigrants in three education groups and five groups of age at immigration. We find that the older the immigrants at the time of immigration, the lower the education attainment tends to be, especially for those 26 and older. For instance, for immigrants who arrived at ages 26-45, 46-65 and >65 years, the shares with less than high school education were 35%, 50% and 60% respectively, while the shares with post secondary education were 35%, 30% and 22%.

Figures 3.6 and 3.7 illustrate another interesting fact: older immigrant ODSP recipients, especially as they approach retirement age, tend to be classified as disability benefit recipients with unknown disability type. This may reflect an attempt to provide financial support when other options are not available. Figure 3.6 presents the share of ODSP recipients classified as a recipient with unknown disability type by age at entry into benefits. Older immigrants (64 and over) with unknown disability type account for over 90% of the older immigrant recipients; a comparable figure for the Canadian-born is in the 20% to 25% range. Figure 3.7 makes the point that the majority of the older immigrants diagnosed with an unknown disability type arrived in Canada at an older age.

Thus, to summarize transition rate behaviour, older immigrants, especially those who arrived in Canada at older ages, are much more likely than their Canadian-born counterparts to enter benefit receipt and much less likely to exit.

Figure 3.8 shows average months-on-benefits by immigration status and by age at entry for 2004 to 2009 entry cohorts. (The maximum would be 60, since each cohort is followed for a period of five years.) As can

be seen, the gap between the average benefit period of immigrant and Canadian-born recipients widens with age; starting from zero months at younger ages (18-24) to a substantial difference after age 64. The difference can be attributed mainly to immigrants who arrived in Canada at older ages.

Months-on-benefits by the age at entry into benefits and by the age at arrival in Canada are presented in Figure 3.9; the light gray bars relate to immigrants who arrived at age 54 or younger and the dark gray bars to those at age 55 and older. The solid black line, considered as reference, represents the Canadian-born. The benefit experience of immigrants who arrived at younger ages is very similar to the Canadian-born; the average months-on-benefits declines for both groups as they approach the retirement age. However, immigrants who arrived at older ages stay much longer on benefits - about 50 months during the first five years of benefits - than the immigrants who arrived at younger ages. Moreover, their spell length was insensitive to the age at entry into benefits; they would have limited access to benefit programs such as CPP and OAS.

Table 3.3 further illustrates the impact on the spell length of immigrants of the age at entry into benefits, immigration status at the time of entry into benefits and immigration category and age at time of arrival in Canada. Panel A of Table 3.3 presents the length of completed and right censored spells of Canadian-born and immigrant recipients within five years of commencement of a first spell, by age at entry into benefits. Younger Canadian-born and immigrant recipients look alike in terms of spell length. In contrast, spells of older immigrants are much longer than those for the older Canadian-born. Spell lengths for different immigration categories at arrival in Canada, and immigration status at the time of entry into benefits, are presented in Panel B. Average spell length of immigrants, except those in the unknown category/status and refugee claimants, is greater than the average spell length of Canadian-born. Panel C shows that the immigrants who arrived in Canada at older ages are generally more likely to have longer benefit spells.

Survival functions on benefits of Canadian-born and immigrant recipients who entered benefits at ages 62 and over are presented in Figure 3.10. The figure shows that the survival rate of both Canadian-born and immigrants decreases with age at entry, but that older immigrants are likely to stay longer on benefits than

older Canadian-born. Moreover, the survival rate of Canadian-born recipients dropped to almost zero after age 64 but remained well above zero for immigrants.

3.5 Regression Methods

Our primary regression approach is duration analysis, where our outcome is time to the event of interest, which in this case is exit from benefit receipt. Although our approach is reduced form, we find it useful to consider, in brief, a stylized description motivated by a model of individual choice.[45] Consider a disability benefit recipient with two choices: (1) continue receiving disability benefits (b); or (2) leave the disability benefits for an alternative income/benefit source such as CPP, OAS, or earnings from work (w). Let V^b and V^w be the value of receiving disability benefits and earnings respectively. Individuals are assumed to choose the alternative that maximises value (i.e., $\max(V^b, V^w)$). We can think of these values as parameterized by individual characteristics (X) and time (t) so that the choice is based on $\max(V^b(X,t), V^w(X,t))$. From our perspective, all individuals begin in state *b* and choose to transition into *w* when $V^w(X,t) > V^b(X,t)$. Instead of attempting to fully specify and identify the above structural model, we consider the problem in reduced form using the well-known and more flexible techniques of duration analysis.

We begin, empirically, by defining the object of interest for analysis, which is to estimate the conditional hazard rate $h(t|x)$, defined as the probability of exit during time period Δt as Δt approaches zero (i.e., an instantaneous rate; assuming continuous time). The baseline hazard, $h_0(t)$, is defined as the hazard rate when $\mathrm{g}(x_i) = 1$, and is often related multiplicatively to a covariate function $\mathrm{g}(x_i)$ as follows

$$h(t|x) = h_0(t)\mathrm{g}(x_i).$$

[45] There could be several reasons of leaving disability benefits and some of the exits (e.g., disqualification, death) may not be due to recipient's free will rather imposed. Therefore, the underlying assumption, individual choice, of the above-mentioned framework may not always hold. In this case, identification would need an assumption of exogeneity of the non-choice related processes of exit.

By far the most commonly used, and analytically simple specification, is the semi-parametric Cox Proportional Hazards (PH) model. For a parameter vector (β_i), the Cox PH model is specified as

$$h(t|x) = h_0(t)\exp(\beta_i x_i).$$

When estimated by partial likelihood using information on the observed order of events (i.e., observed exits or censored observations), the baseline hazard rate, $h_0(t)$, does not need to be specified (i.e., it is non-parametric) and it is not estimated. On the other hand, the covariate relationship with the baseline is fully parameterized.

A primary assumption of the Cox proportional hazard model is that the relative hazard is constant over time. This is the titular proportionality assumption. For instance, if recipients with a physical disorder are twice as likely to exit from ODSP at 3 months as recipients with mental disorder, then they should also be twice as likely to exit at 6 months, one year, and so forth. To validate the appropriateness of the proportional hazard assumption, we use both graphical and statistical techniques.[46] Most of the variables included failed to meet the proportional hazard assumption.

Violation of the proportional hazard assumption suggests time dependent effects of recipients' characteristics on the probability of exit from ODSP. Therefore, we also consider a flexible parametric specification with time dependent covariates of the baseline following Royston and Parmar (2002) and Royston and Lambert (2009). In this approach, both the baseline hazard and time interactions with covariates are specified flexibly using restricted cubic spline functions (i.e., a linear specification for the tails of the distribution and alternative cubic specifications within intermediate cut-points). The cubic spline specification and knot choice for splines was based on Akaike Information Criterion (AIC) and Bayesian Information Criterion (BIC).

[46] The statistical techniques rely on a standard post estimation technique which constructs Shoenfeld residuals after fitting a Cox model, and tests whether the residuals are uncorrelated with ranked failure time. This should be the case if the PH assumption holds. For graphical assessment of the PH assumption we used log-log survival curves stratified by recipients' characteristics. If the PH assumption holds these curves should be parallel. We find this to be violated in many instances.

A higher exit rate early on (first one and half years), which rapidly declines, indicates that traditional parametric survival models lack the flexibility which is needed to model the baseline hazard. There is also a strong indication that time dependent effects are present for many covariates. The Royston-Parmar (RP) modelling setup handles both issues nicely.

3.6 Discussion of Empirical Results

The estimates of the covariates for the Cox PH duration models are presented in Table 3.4. As the non-linear nature of the hazard functions complicates the interpretation of the coefficients, for ease of interpretation, hazard ratios (exponentiated coefficient estimates) are reported. For the flexible parametric RP model estimates the relationship of hazard functions is not proportional; it varies with time according to the relationship parameterized using spline functions and the estimates are difficult to interpret. For that reason, we opt to show the time varying covariate effects of recipient characteristics graphically, in Figures 3.11 and 3.12. The parameter estimates are reported in Table 3A in the appendix III.

We estimate four models to compare the differences between the ODSP benefit use of immigrant and Canadian-born recipients. All model estimates are based on the full set of observations for the ten-year period 2004 - 2013. The second column of Table 3.4 reports the estimates with a single dummy variable to distinguish between Canadian-born and immigrant recipients together with additional controls, but no interaction terms. Columns three and four present estimates for immigrant and Canadian-born recipients separately. Estimates of a model which interacts the immigrant indicator with other covariates is presented in appendix III; column five reports the statistical significance of terms in the interacted model. We also estimated the equations separately by gender; since the differences are slight, we do not report the results for females and males separately.

The table reports the hazard ratio with respect to the baseline hazard function (i.e., the hazard function when all covariates are zero). The reference group for each explanatory variable is indicated in column one. For example, ‘18-24’ is the reference category for the age (at entry) group. Thus, the hazard ratio for ‘25-34’ is

the ratio of the hazard rate of a recipient in that category compared to the hazard rate of a recipient in the `18-24' category. A hazard ratio greater than one implies a higher rate or probability of exit from benefits and vice versa. Thus someone 25-34 is 55% more likely to exit that an 18-24-year-old and an immigrant 9% more likely to exit than a Canadian-born.

Looking first at the age at entry into benefits after controlling for observed covariates, the conditional estimates mirror the findings of the descriptive analysis. That is, the likelihood of exit from benefits generally increases with age at entry into benefits. This is true for both Canadian-born and immigrant recipients; however, as expected, the likelihood of leaving benefits is greater for Canadian-born recipients, especially at older ages. Canadian-born recipients older than 64 are 15 times more likely to leave benefits than those 18-24; in contrast, older immigrants are only 7 times more likely than younger immigrants. As mentioned earlier, one plausible explanation for this is that older Canadian-born recipients may have income options after retirement, such as OAS, for which many older immigrant recipients may not qualify.

The estimates hazard ratios of age at arrival for immigrant recipients suggest that the likelihood of exit decreases with age at immigration; immigrants arriving at older ages are much more likely to stay on benefits than those who arrive at younger ages. For instance, immigrants who arrived in Canada when older than 64 are 51% less likely to exit from benefits than those who arrived before age 44, the base category.

The duration of benefits of immigrants also differs across immigration categories and immigration status. Immigrants with permanent resident status at the time of entry into ODSP are much more likely to exit from ODSP than those with refugee or refugee claimant status. Immigrants who had arrived in the economic class category are much more likely to exit than those who arrived in the family class or refugee class. For instance, family class immigrants and refugees are about 40% to 46% less likely to exit from benefits than economic class immigrants.

Recipients with a mental disorder are least likely to exit among diagnosis categories. Interestingly, the exit probability of immigrant recipients is higher than for Canadian-born recipients in all disability categories

except Unknown. This is important to note, since most older immigrants are assigned to the Unknown disability category (see Figure 3.6). Even after controlling for disability type, the age-effects remain.

The hazard ratio estimates generally imply that the exit rate increases in education. This is in line with the findings of the existing literature. Recipients in the highest education category (post secondary), are about 10% more likely to exit than recipients with lowest (0-8 years) education category. As for the likelihood of exit of immigrant and Canadian-born recipients in relation to education, compared to the lowest education category, immigrant recipients with some high school education are less likely to exit by 3% and Canadian-born by 8% whereas immigrant recipients with postsecondary education are more likely to exit by 6% and Canadian-born by 13%. The noticeable difference between immigrant and Canadian-born recipients is in relation to some high school and postsecondary education. Immigrants with some high school are about 5% more likely to exit and those with postsecondary education are about 7% less likely to exit than their Canadian-born counterparts.

Recipients who are married or living common law are 55%, and recipients who are divorced, separated or widowed are 28%, more likely to exit than recipients who are never married. There are notable differences between immigrant and Canadian-born recipients: immigrants are about 37% less likely to exit if married or living common law and 15% less likely if divorced, separated or widowed than their counterpart Canadian-born recipients. The presence of children is also associated with a reduced probability of exit from benefits; the estimates indicate that Canadian-born recipients are slightly more likely to exit than immigrant recipients in all number of children categories.

Estimates for accommodation type are statistically significant for the Owned and Other accommodation categories. Recipients who rent, live in subsidized housing, or have other accommodations are less likely to exit than homeowners. Immigrants are more likely to exit from benefits than Canadian-born if they owned a house or are living in the other type of accommodation. Finally, males, especially the Canadian-born, are slightly more likely to exit from benefits.

The estimates of the hazard ratios provide important insights into how the various explanatory factors affect the probability of exit from ODSP. Recipients with mental disorders, who are younger, less educated, and single are less likely than otherwise similar groups to exit. The presence of children also reduces the probability of exit.

Results based on the flexible parametric RP models are presented in Figure 3.11; it shows hazard rates of the time varying effects on exit of age at entry into benefits. Again, lower hazard rates imply slower exit from benefits and vice versa.

The upper two plots present hazard rates, separately for immigrant and Canadian-born recipients, by age at entry into benefits. As expected, the likelihood of exit from benefits increases with age at entry into benefits. The likelihood of exit, however, decreases with time on benefits for all age groups except 55-64. Recipients' access to alternative benefit program such as CPP and OAS could be a possible explanation of this phenomenon. This is true for both Canadian-born and immigrant recipients. We see stark differences between immigrant and Canadian-born recipients at older ages, especially 65 and older. For example, Canadian-born recipients 65 and older at entry into benefits are much more likely to exit than are otherwise similar immigrant recipients. Moreover, the likelihood of exit from ODSP of 65 and older immigrants decreases at a faster rate than similar Canadian-born recipients; the hazard rate for immigrants reaches to a near zero level much earlier than Canadian-born recipients - around 6^{th} verses 9^{th} year of benefits. This points to the fact that older Canadian-born recipients exit from benefits much faster than older immigrants.

The bottom panel of Figure 3.11 presents the ratio of the hazard rates of Canadian-born recipients relative to immigrant recipients. A ratio of less than one implies slower exit from ODSP of Canadian-born recipients relative to immigrant recipients. Younger Canadian-born recipients exit from ODSP at slower rates in the first two or three years after the start of benefit receipt, but at (relatively) faster rates thereafter. By contrast, older (65 and older at entry into benefits) Canadian-born recipients have the notably higher rates of exit than immigrant recipients and the difference increases with time.

Figure 3.12 illustrates the effects of age at immigration on exit from ODSP. The hazard rates by age at immigration in the upper left panel show that the likelihood of exit from ODSP decreases with age at immigration. Those who immigrated at 40 or younger are much more likely to exit.

The bottom left panel shows hazard rates by age at immigration for immigrants who were 65 years or older at entry into benefits. The stark difference from the upper left panel is that the immigrants who immigrated at 25 years of age are much more likely to exit from benefits. As mentioned earlier, this could possibly be attributed to the selection process that presumably admits immigrants of good health. Moreover, most of these immigrants could potentially have around 40 years of work history required to qualify for alternate benefits programs by retirement.

Hazard ratios by age at immigration relative to the hazard rates of immigrants and Canadian-born who were 65 and older at entry into ODSP are presented in the upper and bottom right panels respectively. The panels exhibit similar trends in terms of general shape, but hazard ratios differ in magnitude. Immigrants who immigrated when 65 and older are less likely to exit from ODSP for about the first 7 years of benefit receipt when compared to immigrants who immigrated younger than 65 and, when compared to Canadian-born, for the entire 11 years.

3.7 Conclusion and Policy Implications

The immigrant portion of the Ontario population has grown substantially, increasing from 3.0 million to 4.1 million between 2001 and 2016. As part of this population influx, the number of older immigrants has also increased at a rapid pace. Such shifts in the population distribution of immigrants inevitably translate into health-related pressures on the public sector, including disability support programs. We use duration analysis over the period 2003 to 2013 to examine the ODSP benefit receipt of immigrants, with particular attention to older ones, and document how their use of ODSP differs from that of the Canadian-born. We present several results of interest.

We find that the rate of benefit receipt varies with age, but in ways that differ between immigrants and the Canadian-born. Immigrants are, on average, 10 years older at the time of entry into benefits. While the benefit receipt rates are higher for the Canadian-born at younger (18-34) and middle (35-54) ages, they are lower at older (55 and over) ages. We speculate that the difference at younger and middle ages can be largely explained by the healthy immigrant effect and, at older ages, by differential eligibility for and expected income from benefit programs such as the Canada Pension Plan pension, Old Age Security, and the Guaranteed Income Supplement. Most older immigrant recipients do not qualify for these alternative support programs.

We also find that the benefit duration of immigrant recipients is positively associated with age at immigration. Those arriving in Canada at 65 and older are 66% less likely to exit from benefits than those who arrived before age 44. This can possibly be attributed to the selection process that presumably admits younger immigrants in good health and with productivity and skill level that enable them to adapt rapidly to the local culture and labor market. Moreover, many and perhaps most of the younger immigrants would have the 40 or so years of work history that is required to qualify for full benefits from alternative programs.

The analysis indicates a clear association between the probability of exit and both immigration category and current immigration status. We find that permanent residents or Canadian citizen who enter ODSP are much more likely to exit than conventional refugees or refugee claimants. Moreover, immigrants who arrived in Canada under the economic class are about 40% more likely to exit than those who arrived under the family class or as refugees.

The literature from other countries also suggests that a better understanding of the socio-economic and demographic characteristics of immigrants in relation to the structure of the host country's welfare system structure could play an important role in reducing benefit dependence. Although the nature of the data used here limits the possibility of gleaning direct policy implications, the analysis does find a clear association between the probability of exit and the socio-demographic characteristics of ODSP recipients; of particular note are age at entry into benefits, age at immigration, immigration category and current immigration status.

That is valuable information that could inform policy. For instance, the results could be used to improve the projections of caseload growth in the ODSP. The results also suggest that both immigration and social welfare policy needs to account for age-specific behaviour of immigrant applicants. We also speculate that measures to improve the integration of older immigrants into labor market could help to reduce benefit dependence. However, we acknowledge the need for further research to examine the association between the socio-demographic characteristics of ODSP recipients (especially age, immigration status, and skill level) and their integration into the labour market.

3.8 References

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Table 3.1: Summary Characteristics of Canadian-born and Immigrant Recipients, First Spell Only, 2004 -2013

	Canadians at Birth		Immigrants		Total	
Characteristic	Mean	SE	Mean	SE	Mean	SE
Disability Type						
Mental Disorder	0.490	0.001	0.326	0.002	0.440	0.001
ADP Disorder	0.123	0.001	0.065	0.002	0.105	0.001
Neurotic	0.077	0.001	0.044	0.002	0.067	0.001
Pyschoses	0.223	0.002	0.194	0.003	0.214	0.001
Retardation	0.063	0.001	0.018	0.001	0.049	0.001
Musculoskeletal	0.126	0.001	0.145	0.001	0.132	0.001
Nerves and Sense Organ	0.068	0.001	0.067	0.001	0.068	0.000
Circulatory	0.058	0.001	0.074	0.001	0.063	0.000
Neoplasm	0.031	0.000	0.050	0.001	0.037	0.000
ENMI*	0.034	0.000	0.040	0.001	0.036	0.000
Other	0.091	0.001	0.077	0.001	0.087	0.001
Unknown	0.101	0.001	0.221	0.001	0.138	0.001
Age Group						
Entry Age	39.462	0.033	49.722	0.051	42.590	0.029
18-24	0.210	0.001	0.063	0.001	0.166	0.001
25-34	0.162	0.001	0.093	0.001	0.141	0.001
35-44	0.195	0.001	0.165	0.001	0.186	0.001
45-54	0.253	0.001	0.255	0.002	0.254	0.001
55-64	0.170	0.001	0.268	0.002	0.200	0.001
>64	0.009	0.000	0.155	0.001	0.054	0.000
Education						
0-8	0.102	0.001	0.209	0.001	0.135	0.001
9-11	0.384	0.001	0.197	0.001	0.327	0.001
12-13	0.318	0.001	0.301	0.002	0.313	0.001
Post Sec	0.196	0.001	0.293	0.002	0.226	0.001
Family Structure						
Couples w/o Children	0.063	0.001	0.118	0.001	0.080	0.001
Couples with Children	0.051	0.001	0.119	0.001	0.072	0.001
Singles w/o Children	0.775	0.001	0.641	0.002	0.734	0.001
Singles with Children	0.111	0.001	0.123	0.001	0.115	0.001
Marital Status						
Never Married	0.522	0.001	0.277	0.002	0.447	0.001
Divorced, Seperated, Widowe	0.359	0.001	0.472	0.002	0.394	0.001
Married, Com. Law	0.119	0.001	0.250	0.002	0.159	0.001
Number of Children						
0	0.851	0.001	0.795	0.001	0.834	0.001
1	0.082	0.001	0.096	0.001	0.086	0.001
2	0.045	0.000	0.062	0.001	0.050	0.000
3+	0.022	0.000	0.047	0.001	0.030	0.000
Accommodation						
Rented	0.815	0.001	0.785	0.001	0.806	0.001
Subsidized	0.093	0.001	0.126	0.001	0.103	0.001
Institutionalized	0.070	0.001	0.073	0.001	0.071	0.001
Owned	0.022	0.000	0.016	0.000	0.020	0.000
Sex						
Females	0.465	0.001	0.508	0.002	0.479	0.001
Males	0.535	0.001	0.492	0.002	0.521	0.001
Total Recipients	183613		80552		264165	

* Endocrine, Nutritional and Metabolic, and Immunity

Table 3.2: Summary Characteristics of Immigrant Recipients, First Spell Only, 2004-2013

	Immigrants	
Characteristic	Mean	SE
Immigration Status		
Canadian Citizen	0.586	0.002
Permanent Resident	0.313	0.002
Conventional Refugee	0.018	0.000
Refugee Claimant	0.071	0.001
Other	0.008	0.000
Immigration Categories		
Applicant for Landing	0.029	0.001
Family Class	0.285	0.002
Refugee	0.164	0.001
Other	0.327	0.002
Unknown	0.195	0.001
Age at Immigration		
0-17	0.219	0.001
18-25	0.149	0.001
26-45	0.353	0.002
46-65	0.163	0.001
>65	0.077	0.001
Unknown	0.039	0.001
Total Immigrant Recipients	80552	

Table 3.3: Average Spell Length (months) of Canadian-born and Immigrant Recipients by Age at Entry into the Benefits (within First Five Years of Entry), 2004 to 2009 Entry Cohorts, First Spell Only

	Age at Entry into the Benefits						Spell Length
	18-24	25-34	35-44	45-54	55-64	>64	(avg.)
Panel A							
Completed Spells							
Canadian-born	24.3	20.8	18.1	17.2	18.8	8.1	17.9
Immigrants	24.8	22.1	21.5	19.0	23.3	21.9	22.1
Censored Spells							
Canadian-born	53.4	52.4	52.3	51.9	48.2	21.4	46.6
Immigrants	53.3	52.4	52.4	52.6	49.5	48.2	51.4
All Spells							
Canadian-born	45.9	39.4	37.4	34.8	28.0	8.6	32.4
Immigrants	45.2	38.8	38.9	36.6	32.1	27.7	36.5
Panel B							
Immigration Status							
Canadian-born	45.9	39.4	37.4	34.8	28.0	8.5	32.4
Citizen	45.7	39.3	39.7	37.1	32.0	21.7	35.9
Permanent Resident	45.4	40.0	38.8	36.0	33.1	32.2	37.6
Refugee-Conventional	42.9	32.8	37.9	37.7	38.1	38.7	38.0
Refugee-Claimant	38.2	31.5	28.7	32.1	27.8	31.0	31.5
Unknown	33.5	21.1	42.2	24.9	21.1	23.6	27.7
Immigration Category							
Economic Class	44.3	34.9	37.0	36.3	30.2	23.2	34.3
Family Class	48.0	43.2	44.1	41.1	36.5	31.8	40.8
Refugee	42.8	40.3	41.0	44.1	38.8	35.3	40.4
Other	48.5	43.4	42.6	42.1	36.4	30.5	40.6
Unknown	41.0	36.2	35.7	31.5	23.4	15.3	30.5
Panel C							
Age at Immigration							
>0-17	45.5	39.5	40.2	35.0	31.6	10.6	33.8
18-24	44.1	41.0	38.5	35.5	32.2	11.0	33.7
25-34		35.8	39.0	35.2	30.4	10.9	30.3
35-44			36.4	38.9	33.0	10.2	29.6
45-54				38.7	32.6	14.4	28.6
55-64					35.8	28.5	32.1
>64						32.9	32.9
Unknown	41.8	40.2	39.7	32.1	24.9	7.8	31.1

Table 3.4: Cox PH Models Estimates: The Effects of the Benefit Recipients' Characteristics on the Probability of Exit from Benefits, First Spell Only, 2004-2013

Explanatory Variables	Full Sample		Immigrants		Canadian-born		Interacted Model
	Hazard Ratio	SE	Hazard Ratio	SE	Hazard Ratio	SE	Stat. Singnificance
Immigrant (Canadian-born)	1.092	0.091					
Age Group (18-24)							
25 - 34	1.552***	0.028	1.507***	0.070	1.488***	0.030	
35 - 44	1.500***	0.027	1.392***	0.062	1.454***	0.029	**
45 - 54	1.526***	0.027	1.250***	0.055	1.548***	0.030	***
55 - 64	3.387***	0.060	2.990***	0.131	3.277***	0.065	**
>64	10.44***	0.278	7.317***	0.377	15.01***	0.477	***
Disability Type (Mental Disorder)							
Musculoskeletal	1.112***	0.014	1.265***	0.029	1.042**	0.016	***
Nerves and Sense Organ	1.269***	0.021	1.263***	0.039	1.261***	0.025	
Circulatory	1.388***	0.021	1.398***	0.037	1.361***	0.025	
Neoplasms	2.997***	0.047	2.977***	0.079	2.992***	0.059	
ENMI*	1.215***	0.024	1.300***	0.044	1.171***	0.029	*
Other	1.288***	0.019	1.403***	0.039	1.252***	0.022	**
Unknown	1.802***	0.022	1.573***	0.036	1.983***	0.028	***
Education (0-8)							
9 - 11	0.929***	0.011	0.957*	0.020	0.922***	0.014	*
12 - 13	0.995	0.012	0.992	0.018	1.000	0.015	
Post Sec	1.095***	0.013	1.060***	0.019	1.130***	0.018	***
Marital Status (Never Married)							
Divorced, Separated, Widowed	1.283***	0.013	1.161***	0.023	1.310***	0.016	***
Common Law, Married	1.549***	0.019	1.321***	0.030	1.685***	0.025	***
Children (No Children)							
1	0.746***	0.011	0.695***	0.018	0.783***	0.015	**
2	0.789***	0.016	0.728***	0.025	0.837***	0.020	**
3+	0.692***	0.018	0.600***	0.025	0.781***	0.027	***
Accommodation (Rented)							
Subsidized Housing	1.024	0.013	0.985	0.020	1.043**	0.016	
Owned	1.444***	0.018	1.549***	0.035	1.379***	0.021	***
Other	1.375***	0.030	1.807***	0.071	1.201***	0.032	***
Sex (Females)							
Males	1.026***	0.008	1.007	0.014	1.054***	0.010	***
Age at Arrival (up to 44)							
45 - 64	0.911***	0.014	0.983	0.017			**
>64	0.338***	0.009	0.485***	0.014			***
Immigration Status (Citizen)							
Permanent Resident	1.345***	0.112	0.779***	0.048			***
Conventional Refugee	1.059	0.090	0.606***	0.038			***
Refugeee Claimant	0.723**	0.072	0.404***	0.033			***
Other	0.906	0.081	0.534***	0.036			***
Unknown	1.839***	0.189	Omitted				
Immigration Categories (Economic Class)							
Family Class	0.567***	0.010	0.608***	0.011			***
Refugee	0.507***	0.012	0.536***	0.013			***
Other	0.541***	0.009	0.574***	0.010			***
N	264165		80552		183613		264165

*ENMI - Endocrine, Nutritional and Metabolic, and Immunity, Base Outcome - Exit, * p<0.05, ** p<0.01, *** p<0.00

Figure 3.1: Caseload, Entries and Exits of Canadian-born and Immigrants, First Spell Only, 2004-2013

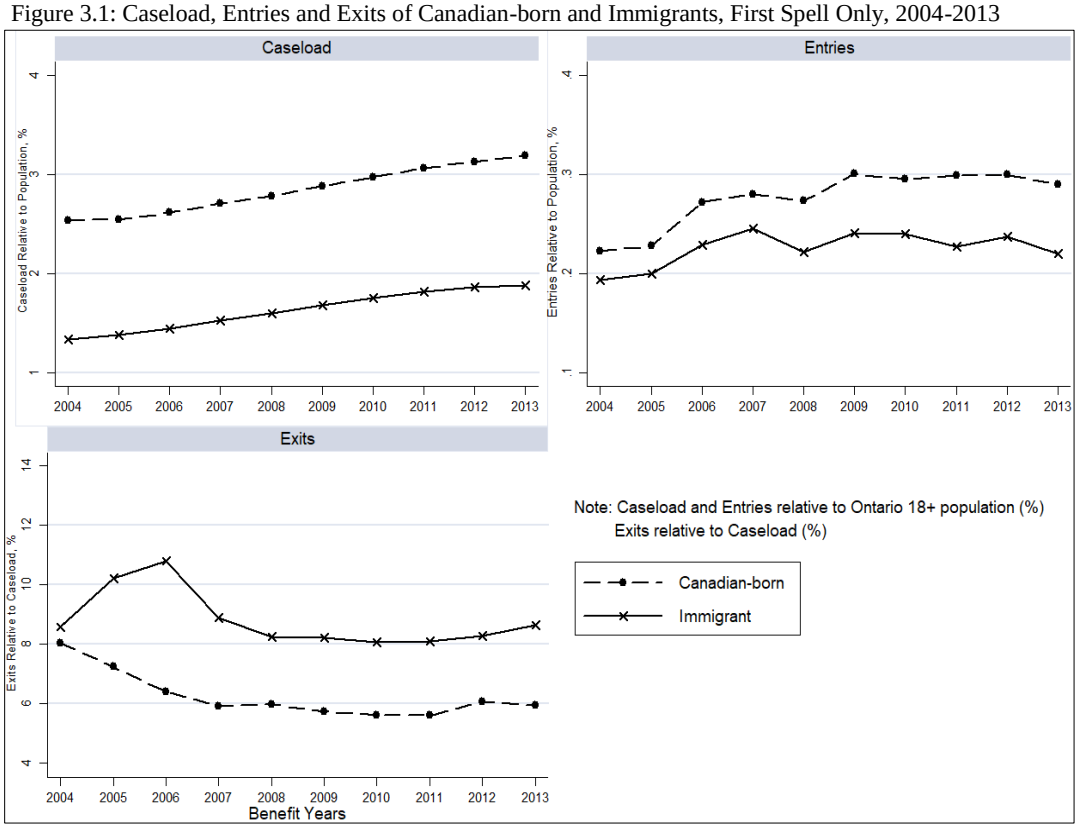


Figure 3.2: Benefit Receipt Rates, % of Ontario Population, of Canadian-born and Immigrant Recipients by Age at Entry into Benefits, First Spell Only, 2003-2013

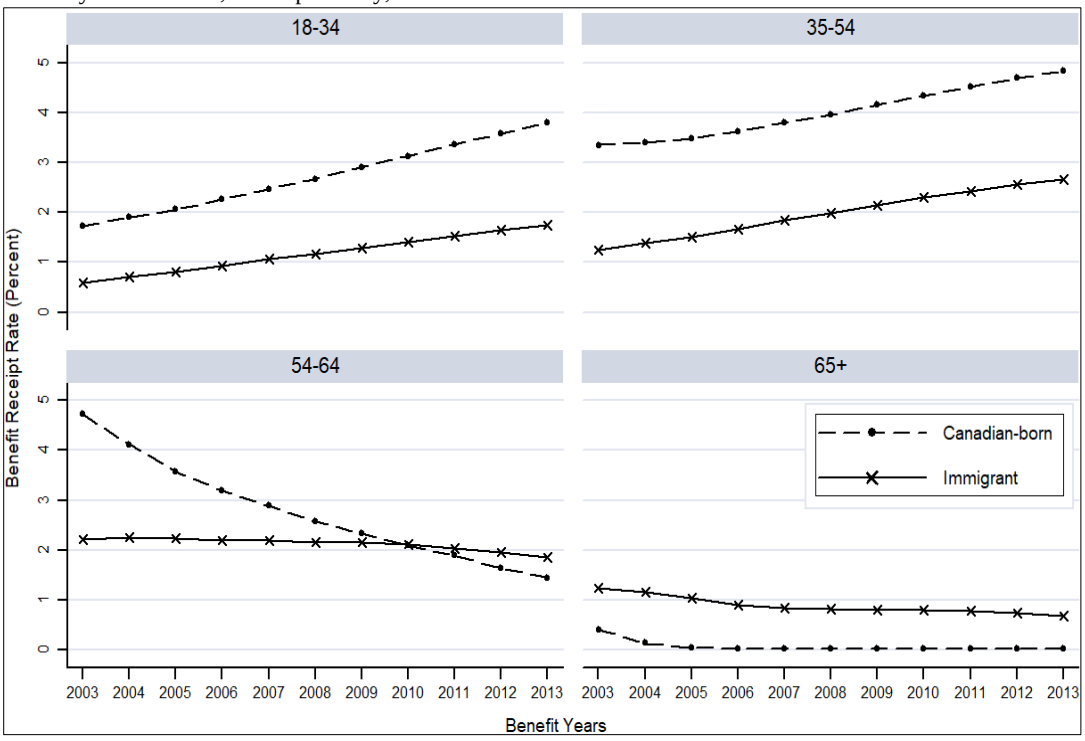


Figure 3.3: Entry Rates, % of Ontario Population, of Canadian-born and Immigrant Recipients by Age at Entry into the Benefits, First Spell Only, 2004-2013

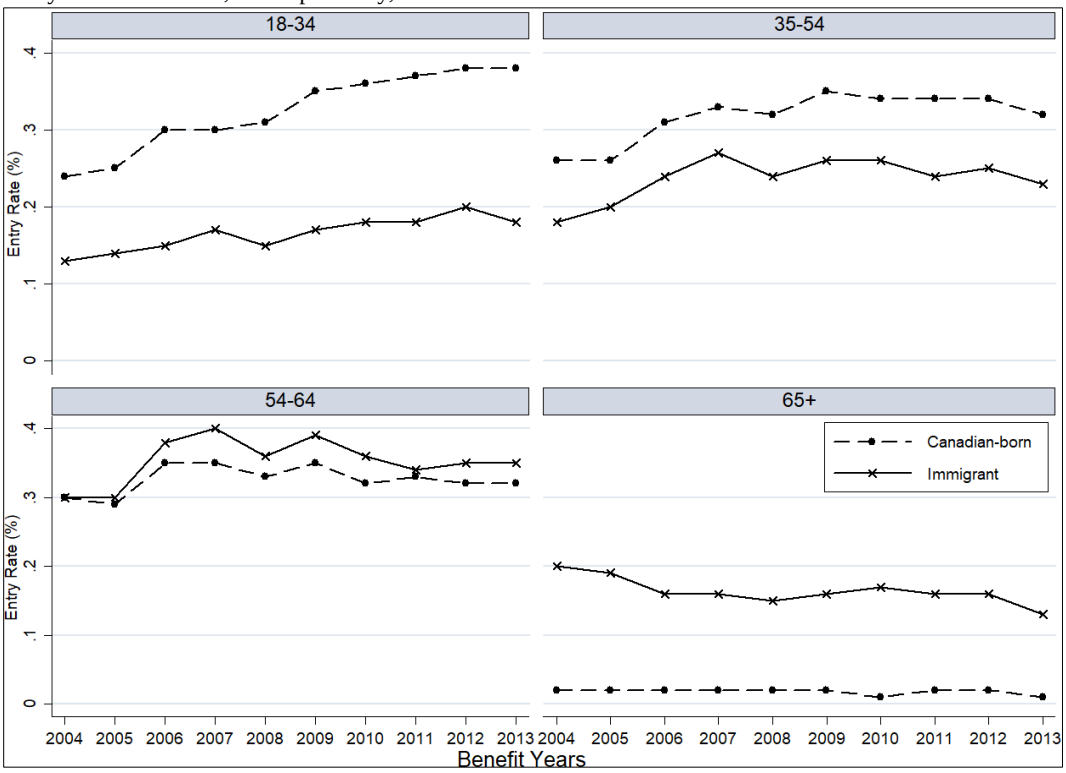


Figure 3.4: Exit Rates, % of Caseload, of Canadian-born and Immigrant Recipients by Age at Entry into Benefits, First Spell Only, 2004-2013

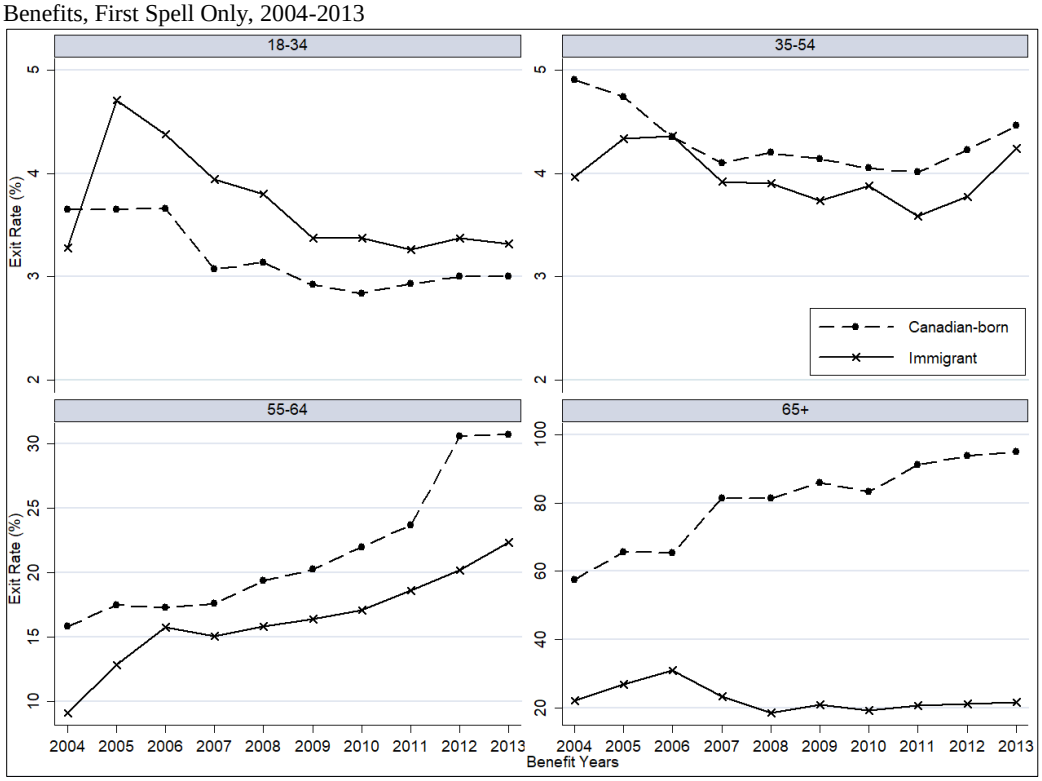


Figure 3.5: Education Attainment of Immigrant Recipient by Age at Immigration, %, First Spell Only, 2004-2013

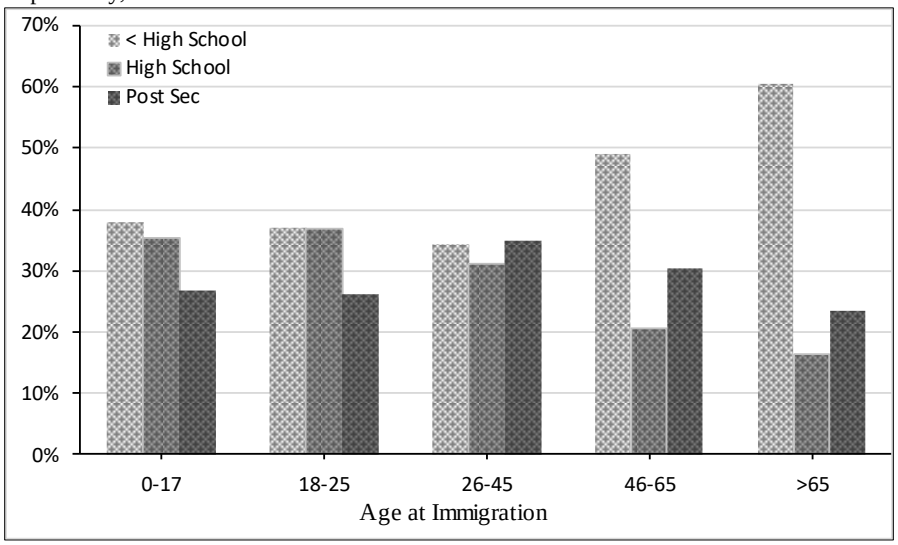


Figure 3.6: Distribution of Canadian-born and Immigrant Recipients Diagnosed with Unknown Disability Type, First Spell Only, 2004-2013

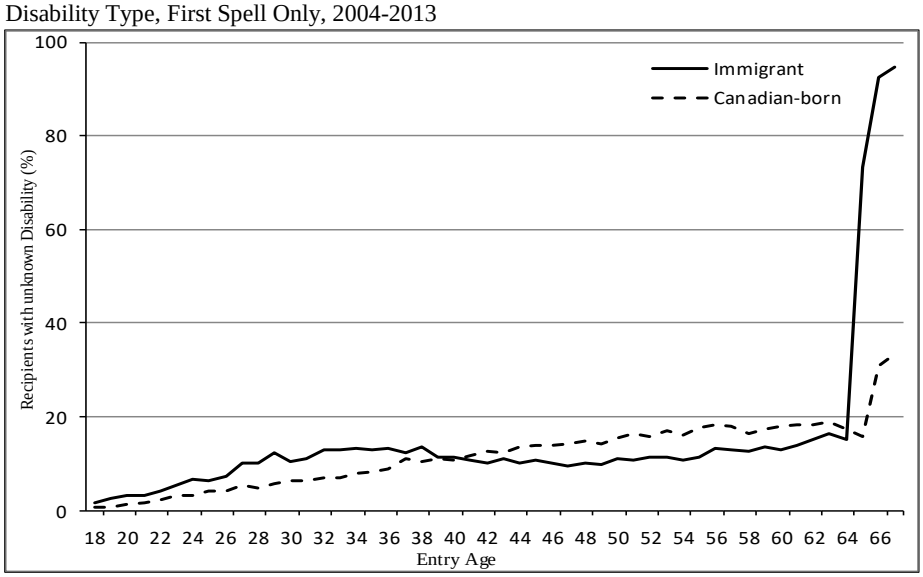


Figure 3.7: Distribution of Recipient with Unknown Disability Type by Age at Entry into Benefits, %, First Spell Only, 2004-2013

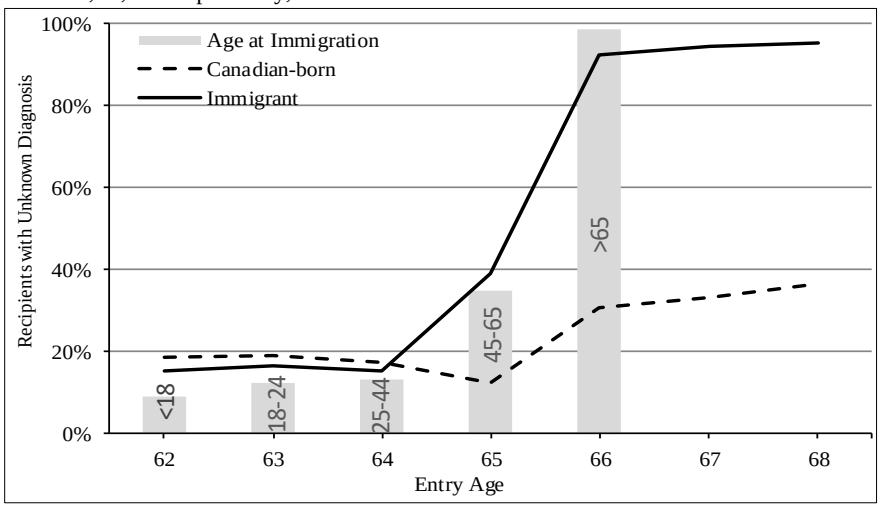


Figure 3.8: Months on Benefits (within five years of entry) by Age at Entry into Benefits and Immigration Status, 2004-2009 Entry Cohorts, First Spell Only

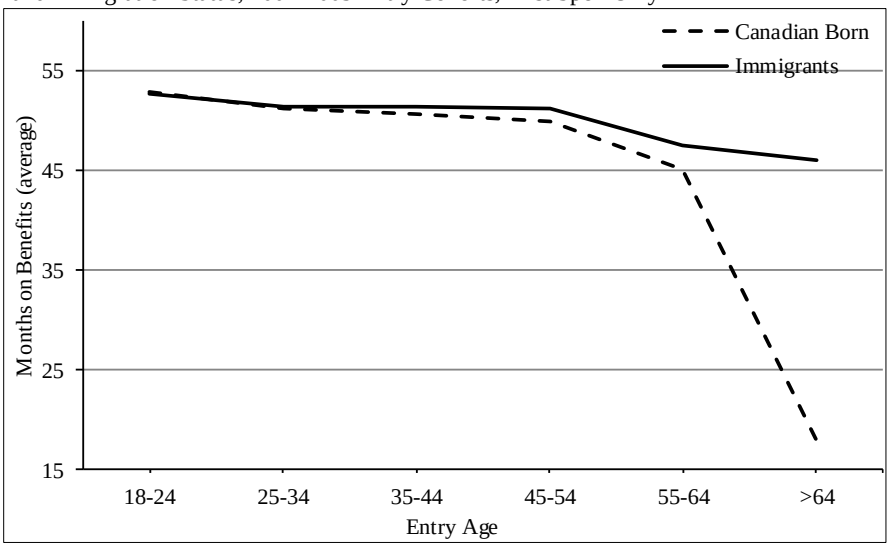


Figure 3.9: Months on Benefits (within five years of entry) by Entry Age and Age at Immigration, 2004-2009 Entry Cohorts, First Spell Only

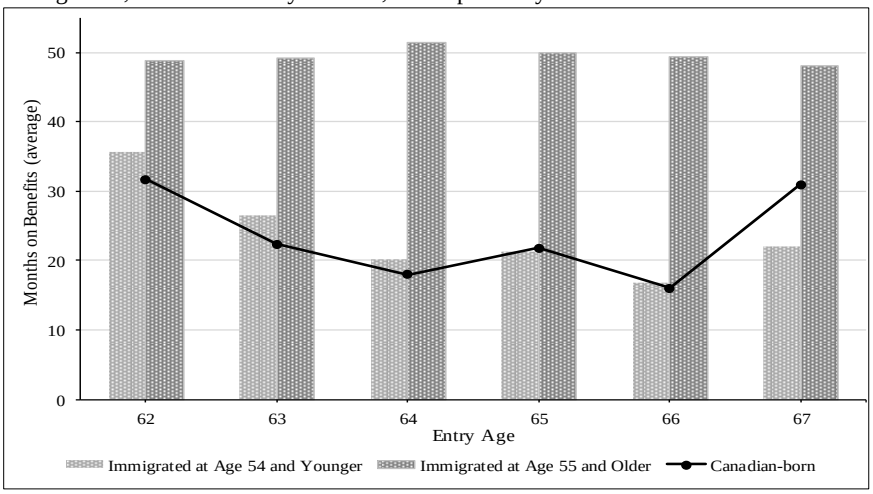


Figure 3.10: Survival Functions, within First Six Years of Benefit, by Age at Entry into the Benefits, First Spell Only, 2004-2009

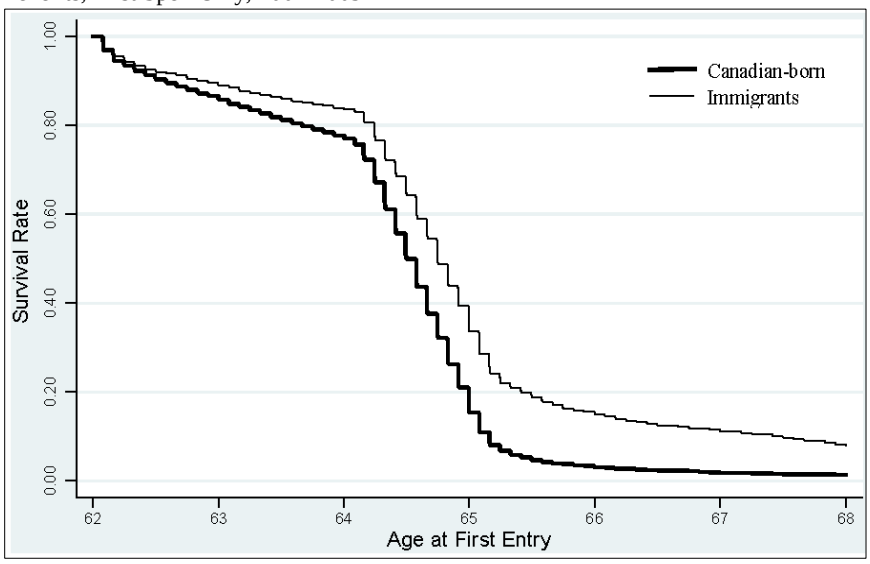


Figure 3.11: Immigrant and Canadian-born Recipients' Hazard Rates by Age at Entry into Benefits, First Spell Only, 2004-2013

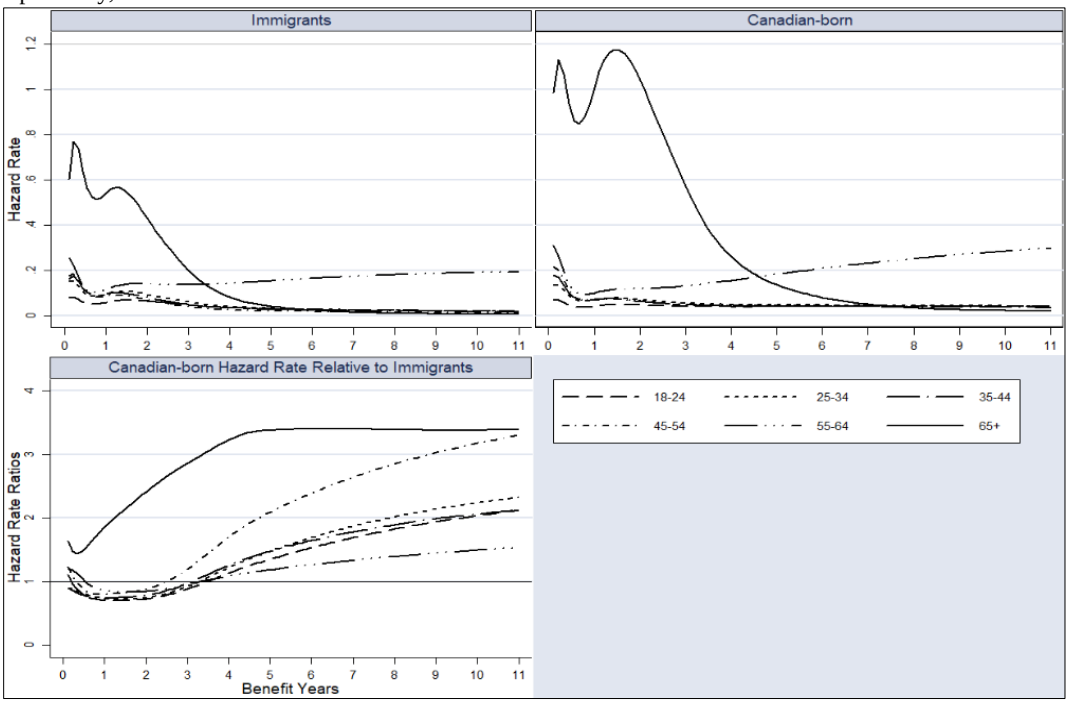
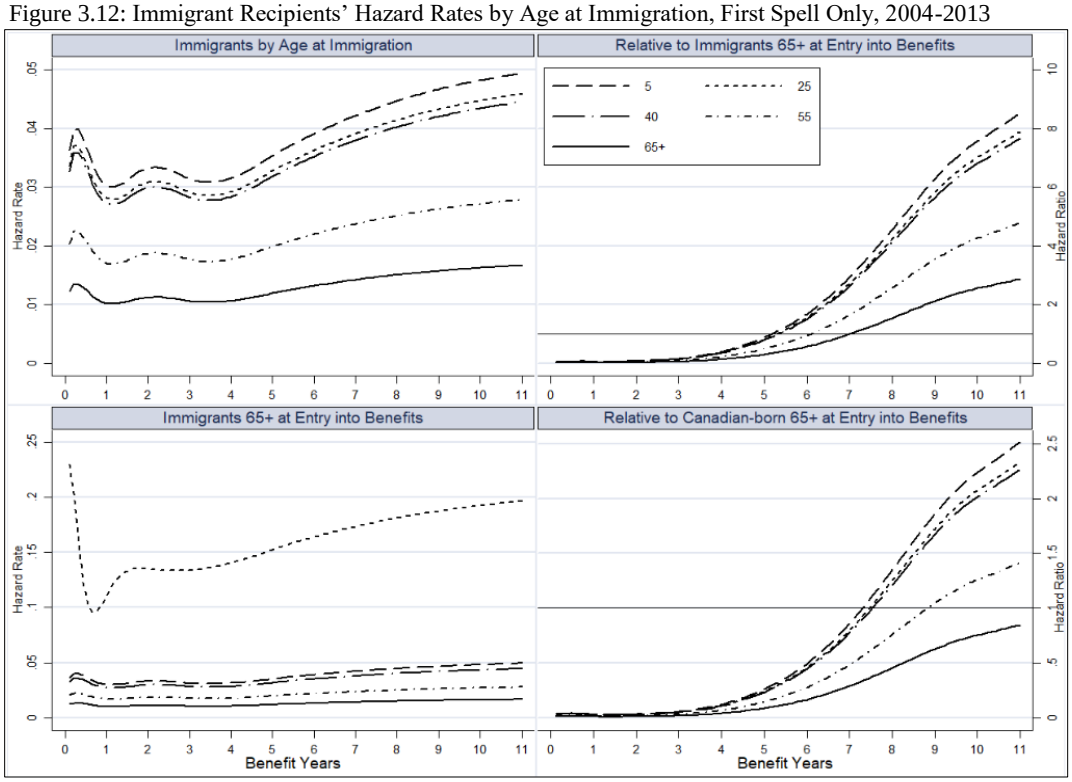


Figure 3.12: Immigrant Recipients' Hazard Rates by Age at Immigration, First Spell Only, 2004-2013



Appendix III

Figure A1: Canadian-born and Immigrant Recipients Relative to Caseload (%), 2003-2013

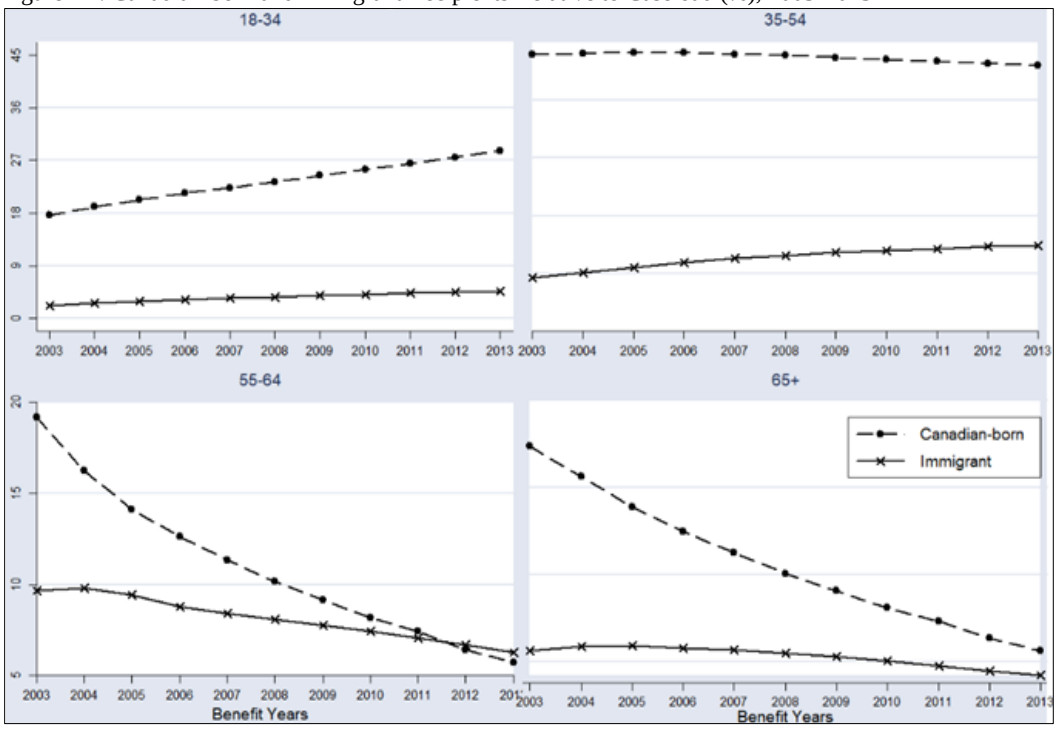


Table A1: Distribution of Immigrant Recipients by Education and Immigration Categories, 2004-2013 (First Spell Only)

Panel A: Distribution of the Age at Entry into Benefits of Immigrant Recipients by Education Attainment						
Education Attainment	18-24	25-34	35-44	54-64	>64	Total
0-8	10.21	10.24	13.33	22.89	43.81	20.95
9-11	48.26	22.22	19.41	17.23	12.42	19.70
12-13	32.47	37.56	33.80	29.41	18.70	30.07
Post Sec	9.06	29.98	33.46	30.46	25.07	29.28
Total	100.00	100.00	100.00	100.00	100.00	100.00
Panel B: Distribution of Immigration Categories of Immigrants Recipients of Age > 64 by Education Attainment						
	Economic Class	Family Class	Refugee	Other	Unknown	Total (>64)
0-8	51.17	40.15	48.82	38.77	43.98	43.82
9-11	11.40	15.76	10.77	11.66	11.71	12.42
12-13	17.25	19.80	17.24	21.32	17.36	18.69
Post Sec	20.18	24.30	23.17	28.26	26.95	25.06
Total	100.00	100.00	100.00	100.00	100.00	100.00
Panel C: Distribution of Immigrants Recipients of Age > 64 by Immigration Categories and Education Attainment						
0-8	3.19	23.75	19.32	16.62	37.06	100
9-11	2.51	32.88	18.15	17.63	28.83	100
12-13	2.52	27.46	17.88	21.43	30.67	100
Post Sec	2.20	25.14	20.70	21.18	30.75	100

Table A2: Flexible Parametric (RP) Models: The Time Varying Effects of the Benefit Recipients' Characteristics on the Probability of First Exit from the Benefits, 2004-2013

Explanatory Variables	Full Sample	Immigrant	Canadian-born	Intracted Model	
Immigrant (Canadian-born)	1.345***				1.167
	(0.0229)				(0.104)
Age Group (18-24)					
25 - 34	1.673***	1.533***	1.611***	0.982	1.617***
	(0.0352)	(0.0820)	(0.0373)	(0.0573)	(0.0371)
35 - 44	1.734***	1.505***	1.668***	0.918	1.690***
	(0.0352)	(0.0768)	(0.0377)	(0.0511)	(0.0376)
45 - 54	1.800***	1.416***	1.779***	0.801***	1.819***
	(0.0355)	(0.0712)	(0.0391)	(0.0438)	(0.0393)
55 - 64	3.450***	2.711***	3.336***	0.823***	3.424***
	(0.0688)	(0.135)	(0.0748)	(0.0449)	(0.0753)
>64	10.35***	6.881***	15.71***	0.441***	16.13***
	(0.288)	(0.386)	(0.599)	(0.0298)	(0.613)
Disability Type (Mental Disorder)					
Musculoskeletal	1.116***	1.261***	1.044**	1.212***	1.042**
	(0.0142)	(0.0286)	(0.0162)	(0.0332)	(0.0161)
Nerves and Sense Organ	1.263***	1.233***	1.263***	0.982	1.260***
	(0.0209)	(0.0375)	(0.0250)	(0.0357)	(0.0249)
Circulatory	1.383***	1.364***	1.367***	0.995	1.367***
	(0.0205)	(0.0358)	(0.0246)	(0.0316)	(0.0246)
Neoplasm	3.001***	2.897***	3.027***	0.961	3.024***
	(0.0471)	(0.0765)	(0.0597)	(0.0317)	(0.0596)
Endocrine, Nutritional and Metabolic, and Immunity	1.211***	1.282***	1.169***	1.095*	1.168***
	(0.0238)	(0.0431)	(0.0285)	(0.0455)	(0.0285)
Other	1.289***	1.390***	1.250***	1.104**	1.251***
	(0.0189)	(0.0385)	(0.0216)	(0.0361)	(0.0216)
Unknown	1.811***	1.550***	1.984***	0.779***	1.989***
	(0.0220)	(0.0355)	(0.0283)	(0.0210)	(0.0283)
Education (0-8)					
9 - 11	0.932***	0.954*	0.898***	1.066*	0.896***
	(0.0110)	(0.0219)	(0.0144)	(0.0298)	(0.0144)
12 - 13	0.995	0.985	0.967*	1.021	0.964*
	(0.0115)	(0.0199)	(0.0158)	(0.0265)	(0.0157)
Post Sec	1.092***	1.037	1.068***	0.970	1.065***
	(0.0128)	(0.0204)	(0.0184)	(0.0254)	(0.0183)
Marital Status (Never Married)					
Divorced, Separated, Widowed	1.286***	1.167***	1.352***	0.892***	1.310***
	(0.0130)	(0.0231)	(0.0174)	(0.0204)	(0.0154)
Common Law, Married	1.558***	1.333***	1.806***	0.784***	1.687***
	(0.0193)	(0.0305)	(0.0287)	(0.0214)	(0.0254)
Children (No Children)					
1	0.741***	0.688***	0.747***	0.887***	0.778***
	(0.0113)	(0.0181)	(0.0154)	(0.0285)	(0.0145)
2	0.783***	0.716***	0.815***	0.866***	0.831***
	(0.0154)	(0.0241)	(0.0215)	(0.0359)	(0.0202)
3+	0.687***	0.593***	0.752***	0.763***	0.778***
	(0.0182)	(0.0245)	(0.0285)	(0.0413)	(0.0271)
Accommodation (Rented)					
Subsidized Housing	1.031*	0.999	1.042**	0.964	1.040*
	(0.0126)	(0.0200)	(0.0161)	(0.0243)	(0.0160)
Owned	1.458***	1.583***	1.380***	1.143***	1.387***
	(0.0181)	(0.0352)	(0.0207)	(0.0306)	(0.0207)
Other	1.402***	1.875***	1.203***	1.547***	1.211***
	(0.0309)	(0.0732)	(0.0324)	(0.0734)	(0.0325)
Sex (Females)					
Males	1.027***	1.012	1.038***	0.995***	1.042***
	(0.00793)	(0.0139)	(0.0105)	(0.000965)	(0.00814)
Age at Arrival (up to 44)					
45 - 64	0.874***	0.952**			0.951**
	(0.0149)	(0.0174)			(0.0175)
>64	0.283***	0.384***			0.384***
	(0.00740)	(0.0114)			(0.0114)
Immigration Status (Citizen)					
Permanent Resident	0.800***	0.808***			0.806***
	(0.0122)	(0.0138)			(0.0138)
Conventional Refugee	0.581***	0.584***			0.582***
	(0.0337)	(0.0408)			(0.0412)
Refugeee Claimant	1.333***	1.365***			1.350***
	(0.0433)	(0.0515)			(0.0517)
Other	1.968***	2.150***			2.164***
	(0.137)	(0.152)			(0.154)
Immigration Categories (Economic Class)					
Family Class	0.601***	0.536***			0.534***
	(0.0107)	(0.0105)			(0.0105)
Refugee	0.435***	0.365***			0.363***
	(0.0105)	(0.0103)			(0.0104)
Other	0.557***	0.487***			0.485***
	(0.00966)	(0.00938)			(0.00940)
N	183613	80552	264165	264165	264165

Exponentiated coefficients (HR), SEs in parentheses, * p<0.05, ** p<0.01, ***

Table A3: Regression Estimates - The Effects of Recipients' Characteristics on Benefit Months

Characteristics	Coefficient	St.Error	Coefficient	St.Error
Immigrant (Canadian-born)			-0.0732***	(0.0142)
Age Group (18-24)				
25-34	0.148***	(0.00558)	-0.0974***	(0.0151)
35-44	0.226***	(0.00530)	-0.0747***	(0.0143)
45-54	0.153***	(0.00541)	-0.0698***	(0.0142)
55-64	-0.115***	(0.00612)	-0.00271	(0.0149)
>64	-0.914***	(0.0140)	0.702***	(0.0212)
Disability Type (Mental Disorder)				
Musculoskeletal	0.00228	(0.00495)	-0.0379***	(0.00966)
Nerves and Sense Organ	0.0452***	(0.00563)	-0.0564***	(0.0119)
Circulatory	-0.0776***	(0.00700)	0.0310*	(0.0128)
Neoplasm	-0.517***	(0.0103)	0.0906***	(0.0168)
ENMI*	-0.0318***	(0.00914)	-0.0256	(0.0169)
Other	0.0380***	(0.00525)	-0.0729***	(0.0114)
Unknown	-0.254***	(0.00588)	0.181***	(0.0108)
Education (0-8)				
9-11	-0.147***	(0.00445)	0.0959***	(0.00903)
12-13	-0.201***	(0.00460)	0.0930***	(0.00851)
Post Sec	-0.279***	(0.00519)	0.146***	(0.00885)
Sex (Females)				
Males	-0.0312***	(0.00314)	0.0242***	(0.00625)
Marital Status (Never Married)				
Divorced, Separated, Widowed	-0.0640***	(0.00386)	0.0374***	(0.00812)
Married, Com. Law	-0.0906***	(0.00507)	0.0350***	(0.00993)
Children (no Children)				
1	-0.0445***	(0.00650)	-0.0333**	(0.0123)
2	-0.101***	(0.00902)	-0.0412*	(0.0162)
3+	-0.103***	(0.0126)	-0.0253	(0.0204)
Accommodation (Rented)				
Subsidized	0.113***	(0.00460)	0.0426***	(0.00813)
Institutionalized	-0.114***	(0.00613)	-0.0732***	(0.0121)
Owned	0.133***	(0.00732)	-0.139***	(0.0185)
_cons	3.715***	(0.00580)		
N (number of recipients*benefit months) = 455180				
SEs in parentheses, * p<0.05, ** p<0.01, *** p<0.00, Base Outcome - Months on Benefits, ENMI - Endocrine, Nutritional and Metabolic Diseases, and Immunity Disorders				

Appendix IV

Description of the Ontario Disability Support Program

The Ontario Disability Support Program (ODSP) has been subject to ongoing revisions since its inception. Enormous changes in the rules and regulations have been made, some adding to its complexity. Often, ODSP income support recipients are not aware of benefits for which they may be eligible, and it appears that little effort has been made to provide a description of the program suitable for persons with limited abilities; we note that persons with mental disabilities account for more than half of all beneficiaries. One purpose of this appendix is to provide a detailed description.

Ontario's history of providing and regulating social service programs for people with disabilities traces back to the pre-Union period (1791-1840), when funds were provided to charities and six boards and commissions (asylums and houses of industry). The concept of disability has since evolved, from institutionalization to inclusion into the society and from limitations of abilities to difference of abilities. As Townsend (1979) mentioned, "the way in which an issue is viewed contains an implicit prescription for policy" (p.25).

The 1997 Social Assistance Reform Act brought drastic changes to Ontario's social assistance programs. The Ontario Disability Support Program (ODSP) was created in 1998 from a separate legislative mandate for adults with disabilities. It provides income and employment support to persons with disabilities with special emphasis on gaining employment. The Act, definitions, and operation of the program have been continuously and extensively revised subsequently.

Indeed, it is a challenge to keep up with the program, to navigate its complicated and ever-changing eligibility criteria, application processes, concepts of basic needs and shelter costs, asset limits, income exemptions, and types of benefits. There are about 240 different rates that need to be understood to determine basic needs and shelter costs, 50 to determine child benefits, and 30 to determine special benefits.

This section provides a detailed description of ODSP – eligibility requirements, key definitions, operation of the program, etc. – and the changes that have occurred. It also notes the program reviews that have taken place and comments on the problems that have been identified and the solutions/recommendations that have been proposed so that people with disabilities could navigate the program with ease.

Key Definitions[47]

1. Applicant/recipient:

A person who applies for income support or on whose behalf such an application is made. Generally, the applicant is a person with a disability assessed in accordance with section 4 of the Act and who has met the financial requirements to be on the program or is a member of a prescribed class (more on "a person with disability" and "a member of a prescribed class" in section 2.2).

2. Benefit Unit:

A benefit unit (BU) consists of an applicant/recipient[48] and all of the applicant's dependents that reside with the applicant. A BU differs from a household in that there could be more than one benefit unit in a household; for instance, a financially independent adult child in the same household who applies for income support in his/her own name would constitute another BU. A benefit unit could be a single person or a couple, with or without children. Dependents residing with the applicant are called members of the BU. A (financial) dependent could be a spouse, a child (less than 18 years of age), or an adult child (18 or older) of the applicant or of his or her spouse. A spouse not residing with the applicant for a reason other than a breakdown in the relationship with no reasonable prospect of reconciliation is also considered a dependent.

3. Financial Independence:

[47] Social Assistance Policy Directives.
[48] A recipient is a person to whom income support is provided that is, most of the time, applicant. Often the terms applicant and recipient are used interchangeably.

A financially independent adult can choose to remain a dependent adult in his/her parent(s)'s benefit unit or to become an independent applicant under Ontario Works. If the choice is to remain a dependent adult, then his/her income and assets are included in determining financial eligibility for the benefit unit.

A person is considered financially independent if he/she is 18 years of age or older and if the person

a) has lived away from the parental home after his/her 18th birthday or resides or has resided with his/her spouse at any time in the past or is a parent who has, or has had lawful custody of his/her child,

b) qualified as a "sole support student" under OSAP at any time in the past,

c) has had net income (assets) exceeding the maximum monthly rate (maximum amount of assets permitted) for a single recipient under Ontario Works,

d) has a source, other than the person's parent or an institution, that has been providing person's basic needs and shelter,

e) has received social assistance in his/her own right,

f) a period of five years has passed since the person ceased to attend school or receive home instruction, or

g) has received a degree or a diploma.

Financial independence/dependence of applicant and dependent(s) is one of the prime factors on which determination of financial eligibility, basic needs and shelter cost, of a benefit unit rest. Establishing the financial eligibility of an applicant being the first step in the process of application for income support magnifies the significance of dependent's financial dependence or independence. The choice of whether a financially independent dependent is to remain part of a benefit unit requires a clear definition of dependent's financial independence or dependence. Considering the significance and vulnerability of this

matter, the Commission for the Review of Social Assistance in Ontario[49] (hereafter the Commission) recommended that an adult who chooses to live with his/her parents be automatically deemed financially independent and treated as an applicant in his/her own right if that person is in receipt of income support as a person with disability or whose parent(s) is a person with disability and in receipt of income support.

4. Spouse:

A person, in relation to an applicant, is a spouse if the person

a. together with applicant have declared that they are spouses,

b. is required to support the applicant or any of his or her dependants under a court order or family law or domestic contract,

c. has been residing with the applicant for a period of at least three months and the relationship (social, familial and financial but not sexual) between the two persons is consistent with generally known spousal relationships

The following changes have been made in determining spousal relationship since inception of ODSP.

a. March 01, 2000: Same-sex partners were provided the same rights and obligations as unmarried (common law) opposite-sex partners. On June 13, 2005 the term "same-sex partner" was replaced by the term "spouse",

b. June 28, 2002: The three-year rule was replaced by the three months and three factors (Shared Residence, Financial Interdependence, and Familial/Social Interdependence and Mutual Support) rule.

[49] Commission for the Review of Social Assistance in Ontario (2012), Brighter Prospects: Transforming Social Assistance in Ontario. A report to the Minister of Community and Social Services.

The spousal relationship of people with disabilities is vital for many reasons; it affects their financial eligibility, shelter cost and even their exit from the ODSP rolls[50]. It is argued that three months is too short a time to determine whether the spousal relationship is stable and to judge financial interdependence. Financial interdependence is a serious matter, given the reluctance to establish a spousal relationship with a disabled person that brings financial liability for support. Therefore, the Commission recommended that the period to be changed from three months to one year consistent with the *Income Tax Act* definition of spousal relationship; one year of cohabitation. The Commission also noted that many provincial and federal departments use the "one-year cohabitation" rule to determine family income and hence benefits such as the Ontario Trillium Benefit and the Goods and Services Tax Credit.

5. Benefits:

There are over 30 different types of benefits available to eligible persons with disabilities. What follows is a description of a few of the main benefits for all members of a benefit unit:

1. Health Benefits:
    a. Drugs prescribed, not including the co-payment charged under the *Ontario Drug Benefit Act*,
    b. Dental, vision and hearing services and related items,
    c. Diabetic supplies and surgical supplies and dressings if the cost of the item is not otherwise reimbursed or subject to reimbursement,
    d. Cost of transportation, if $15 or more in the month, that is reasonably required for medical treatment and that is not otherwise reimbursed or subject to reimbursement
2. Extended Health Benefit: The Extended Health Benefits (EHB) are provided if

[50] Empirical evidence suggests that a spousal relationship could help people come out of poverty and hence social assistance?

a. A former recipient who ceases to be eligible for income support because of excess income or a person in receipt of CPP but has high health costs,[51]

b. A person who is ineligible for income support due to receipt of Loss of Income or Loss of Support Payments under the 1986-1990 Hepatitis C Settlement Agreement

3. Employment and Training Start up Benefits: An amount of $500 in any 12-month period is paid if a member begins or changes employment, begins an employment assistance activity under the *Ontario Works Act, 1997*, or begins any other activity intended to assist the person to become and stay employed

4. Employment Transition Benefit: An amount of $500 is paid only once in a 12-month period in a month immediately preceding the month in which a recipient ceases to be eligible for income support due to excess income and expected to have excess income for at least two months

5. Work Related Benefit: A monthly amount of $100 for work-related expenses is paid to a recipient who earns income from employment or a training program, or from the operation of a business

As mentioned earlier, there are over 30 different types of special benefits available to eligible applicant and members of the benefit unit. Not only there are several types of benefits but hundreds of rates and numerous eligibility criteria that add to the complexity of the program. The wide range of benefits, on the one hand, enables the program to respond to a wide range of circumstances and address individualized needs of people with disabilities but, on the other hand, create complexity and a climate of immense confusion.

The Commission, based on the living experiences of people with disabilities, believes that the ODSP benefit structure is too complex and confusing. Most recipients are not even aware of benefits for which they may be eligible. The Commission noted that "Indeed, in a number of our roundtable sessions with people with

[51] Income of a benefit unit equals or exceeds the budgetary requirements of the benefit unit.

lived experience, recipients learned from one another about benefits for which they were eligible but had not known about" (Commission 2012: p.60). Therefore, it appears that the ODSP benefit structure requires overhauling to make it simple and efficient. The Commission recommends replacing the current complex benefit structure by the following three simple building blocks.

1. a standard basic income support for all eligible adults

2. an ODSP supplement, in addition to the basic income support, for people with disabilities

3. a uniform child supplement for people with children

2.2 Eligibility Requirements:

ODSP provides both income and employment support, but with differing eligibility requirements.

A. Eligibility Requirements for Income Support:

The key eligibility requirements for income support under the ODSP Act, 1997 are as follows:

1. Disability: A person must have a disability. A person is a person with disability if
    a. the person has a substantial physical or mental impairment that is continuous or recurrent and expected to last one year or more
    b. the direct and cumulative effect of the impairment on the person's ability to attend to his/her personal care, function in the community and function in a workplace, results in a substantial restriction in one or more of these activities of daily living
    c. the impairment and its likely duration and the restriction in the person's activities of daily living have been verified by a person with the prescribed qualifications
2. Financial Need: A person is considered to be in financial need if the income and assets, after allowed exemptions, of the applicant's benefit unit fall short of the costs of the basic living expenses of the benefit unit

3. Prescribed Classes: Following are the prescribed classes, hence eligible for income support.

    a. Person who on May 31, 1998 was recipient or spouse of the recipient of benefits under the Family Benefits Act

    b. Person 65 years of age or older and not eligible for a pension under the Old Age Security Act

    c. Resident of a facility that is designated as an institution, a psychiatric facility, Centre for Addiction and Mental Health (Toronto), Health Centre (Guelph), former residents of a facility that is designated under the *Developmental Services Act* who ceased to be residents of that facility on or after June 1, 1998 and residents in a home for special care established, licensed or approved under the Homes for Special Care Act

    d. Persons in receipt of disability benefits under the Canada Pension Plan. A person shall be deemed to be in receipt of disability benefits under the Canada Pension Plan for three months following the last month in which he or she receives those benefits

4. Age: The applicant must be of the age of 18 years or older, however a person can initiate income support application process six months prior to his/her 18th birthday

5. Residency: The applicant must be a resident of Ontario. A person who remains absent from Ontario for a period greater than 30 days is not eligible for income support unless a valid reason, e.g. health condition, attendance at a post-secondary institution, etc., is provided

6. Status in the country: An applicant must be a Canadian citizen, permanent resident or have refugee status. Visitors, tourists, and persons against whom deportation or removal orders have been made are not eligible[52]

[52] This rule is subject to certain exceptions.

7. Other Requirements: To qualify for income support a person must fulfill other supplementary conditions – e.g., must not be detained in custody, must exert reasonable efforts to obtain alternative financial resources or income to which the person may be entitled, must provide all information and allow home visits as required determining eligibility

B. Eligibility Requirements for Employment Support:

Eligibility requirements for employment support differ from those for Income Support and a person need not be a recipient of income support to be eligible for employment support. Moreover, eligibility is not a static condition established at the time of application; rather it changes over time as disability, competitive employment goals, and disability-related employment barriers change. The eligibility requirements for ODSP employment support are as follows.

1. A person is determined as a person with disability (defined above in income support eligibility requirements section)

2. A person must intend to and be able to prepare for, obtain and maintain competitive employment. For instance, a person detained in custody in a lawful place of confinement is not eligible for Employment Support as he/she is deemed not to be "able to prepare for, accept or maintain competitive employment”

3. Have "exhausted" services/funding provided by other disability support programs - CPP-D, Vocational Rehabilitation Program, WSIB, EI, OW, The Insurance Act for automobile injuries, or other private insurance. However, a person may be eligible for ODSP Employment Support if he/she has disabilities which are not covered by these programs

4. A person awaiting an appeal of a decision declaring him/her to be ineligible for another program may be eligible for Employment Support if he/she meets the eligibility criteria

5. A person must be 16 years of age or older, resident of Ontario (other than visitors, tourists, and temporary residents) and legally entitled to work in Canada

6. A person receiving OW income assistance is not eligible for ODSP Employment Support. However, ODSP Income Support recipients voluntarily participating in OW employment assistance may also be able to receive ODSP Employment Support

7. A person who is currently employed or has a firm job offer and requires employment support to maintain current employment or to accept a job

2.3. ODSP Income Support Application Criterions and Process:

The complicated process for Income Support application consists of completing and signing at least four[53] prescribed forms and the verification of prescribed information required to determine that the applicant needs financial assistance and has a disability. As the process can take several months, people with dire need of financial assistance may (and usually do) start by applying for financial assistance from OW. That is because OW benefits typically start to flow sooner, but that makes the process even more complex. We can divide ODSP Income Support applicants into two types based on their starting point as either OW applicants (referred by OW) or ODSP applicants (self-referred). The general criteria that are applicable are as follows.

A. General Criteria:

   a. Everyone has the right to make an application for income support

   b. An applicant has the right to have an advocate, friend, or family member attend the application interview

   c. An applicant with special needs has the right to have an interpreter or translator

[53] Health Status Report (HSR), Activities of Daily Living (ADL), Self-Report, and Consent form.

d. Financial eligibility must be established before a Disability Determination Package (DDP) can be provided and a referral made to the Disability Adjudication Unit (DAU)[54]

e. Applicants in immediate financial need can apply for OW financial assistance

B. Application Process: The application process for income support consists of following two steps: establishing financial eligibility and then disability[55].

Step 1: Applicant's financial eligibility for OW income support is established. Generally, personal identification, income, assets, shelter costs, school attendance, status in Canada is verified to establish financial eligibility. This process is comprised of the following two steps.

i. An assessment of the applicant's income and assets with an OW worker via telephone interview

ii. An in-person verification interview at the local OW office followed by a mandatory workshop about workfare requirements

Step 2: Applicant is a person with disability is determined.

i. Referral to the DAU is made and DDP is provided to the applicant

ii. DAU determines whether the applicant is a person with a disability

iii. DAU notifies the applicant and the referring office

iv. If eligibility is established, ODSP office grants income support

The application process appears to be quite cumbersome especially for people with disability. For instance, determining the financial eligibility of an applicant alone requires considering hundreds of rates or

[54] However, DDP can be provided and referral can be made if financial ineligibility is challenged.
[55] Applicants referred by OW need not to go through first step (financial eligibility).

combinations of rates, complicated rules pertaining to spousal relationships and the financial independence of dependents, and multiple asset limits and income exemptions. Furthermore, having two different application processes for ODSP adds to the confusion and complexity. The complexity results in high cost of program delivery and creates barriers to employment for people with disabilities and hence increases ODSP rolls. The Commission for the Review of Social Assistance in Ontario (2012) argues that simplification of the program could play a vital role in putting brakes on the ever-increasing ODSP rolls hence cost of the program.[56] The Commission recommends an integrated social assistance program in place of both OW and ODSP that could effectively and efficiently cater to the needs of people with and without disability.

[56] Commission for the Review of Social Assistance in Ontario, Brighter Prospects: Transforming Social Assistance in Ontario: A Report to the Minister of Community and Social Services (2012).

Conclusion

The dynamics of the ODSP benefit receipt in Ontario are analyzed in this thesis. The analysis is based on individual level administrative data from 2003 to 2013. This thesis is comprised of three self-contained chapters.

The first chapter examines the dynamics of ODSP benefit receipt. We consider, first, selected descriptive features of recipient dynamics that provide insights into trends in the aggregate caseload and the inflows and outflows associated with that caseload. We also explore differences in exit behaviour across groups defined by demographic and contextual characteristics in a spell-based perspective of the transition out of ODSP. Multinomial regression analysis is carried out to investigate the determinants of the type and nature of exits. Finally, logit regression is employed to investigate the impact of the history of benefit receipt.

We find that only about 18 percent of benefit recipients exited within five years of their first spell, most of them within one and half years. However, about 38 percent who did exit were back on benefits within the five years. Although the exit rate is low, we find clear associations between the characteristics of benefit recipients and their probabilities of exit.

Individuals with a mental disorder account for about 50 percent of the total caseload; this group has the highest entry rate, the lowest exit rate, and the highest rate of return after a first non-death exit. Generally, benefit receipt and entry rates increase with age, as does the probability of exit. Education has the opposite relationship: the benefit receipt and entry rates decrease with level of education while the exit rates increase. Immigrants are less likely to enter and less likely to exit; that is, immigrants have lower entry rates and lower exit rates than the Canadian-born. The low entry rates could be partially attributed to the "healthy immigrant effect" and the low exit rates to lower a probability of finding employment. Being single is associated with a higher entry rate, a higher benefit receipt rate, and a higher probability of exit. The presence of children and a history of benefit receipt reduces the likelihood of exit.

Single recipients without mental illness, with their relatively high probabilities of exit, may be suitable targets for employment support programs. It is also likely that singles have less by way of support networks than couples, in which case offering them labor market-oriented support services might help them to cross the labour market entry threshold.

Chapter 2 analyses the duration of ODSP benefit receipt of individuals aged 18-54 in Ontario. Again, the analysis is based on individual level administrative data files from 2003 to 2013. Flexible parametric duration models are employed to explore benefit duration from three different angels: time spent receiving benefits, cure rates, and time spent not receiving benefits. The first analysis provides insight into duration on the benefits (on spells) followed by the cure rate analysis that re-affirms these findings. Finally, we turned our focus to the dynamics of the nature of first exit, re-entry to the benefits (off spells) after a first non-death exit.

We find a clear evidence of association of the recipients' characteristics and duration of ODSP benefits; On-spells (off-spells) tend to be longer (shorter) for those with mental disorders who are younger, less educated, single and have children. Heterogeneity of recipients' characteristics and associated probabilities of leaving or re-entering to the ODSP benefits require differentiated, not 'one size fit all', policies and programs, focusing on those who are most likely to exit from ODSP, to facilitate transitions from benefits dependence to economic independence. The most probable explanation of this phenomenon could be early onset of disability that limits further education and on the job experience opportunities. Therefore, what may be required is customized employment support initiatives such as special training, equipment, and work place accommodations.

The results suggest that improvements in the projection of caseload growth in the ODSP program not only requires a better understanding of recipients' characteristics affecting benefit receipt patterns but also those factors that affect the length of time on/off the disability benefits.

The third chapter examines the ODSP benefit receipt of immigrants and documents how their use of ODSP differs from that of the Canadian-born, with a substantive focus on older disability recipients. We apply duration models to the MCSS individual level administrative data from 2003 to 2013 to investigate immigrant use of ODSP benefits and the association between the probability of exit and age at entry into benefits, age at immigration, immigration category and current immigration status. We present several results of interest.

We find that the rate of benefit receipt varies with age, but in ways that differ between immigrants and the Canadian-born. Immigrants are, on average, 10 years older at the time of entry into benefits. While the benefit receipt rates are higher for the Canadian-born at younger and middle ages, they are lower at older ages. We speculate that the difference at younger and middle ages can be largely explained by the healthy immigrant effect and, at older ages, by differential eligibility for and expected income from benefit programs such as the Canada Pension Plan, Old Age Security, and the Guaranteed Income Supplement. Most older immigrant recipients do not qualify for these alternative support programs.

The benefit duration of immigrant recipients is negatively associated with age at immigration. Those arriving in Canada at 65 and older are less likely to exit from benefits than those who arrived before age 44. This can possibly be attributed to the selection process that presumably admits younger immigrants in good health and with productivity and skill level that enable them to adapt rapidly to the local culture and labor market. Moreover, many and perhaps most of the younger immigrants would have the 40 or so years of work history that is required to qualify for full benefits from alternative programs.

The analysis also suggests a clear association between the probability of exit and both immigration category and current immigration status. We find that the immigrants who entered benefits as permanent residents or Canadian citizen are much more likely to exit than conventional refugees or refugee claimants. Moreover, immigrants who arrived in Canada as economic class are about 40% more likely to exit than family class or refugees.

Our results in chapter 3 could help to improve projections of caseload growth in the ODSP. They also have implications for both immigration and social welfare policy that need to account for age-specific behaviour of potential immigrant applicants.

Although there is established international literature analysing the dynamics of disability benefit receipt, only a few Canadian studies have, to some extent, considered the disability program. Despite its potential importance for social policy, little is known about the dynamics of ODSP benefit receipt. To this end this thesis fills a knowledge gap by providing an empirical analysis of the dynamics of the ODSP benefit receipt.

While this thesis is subject to certain limitations (especially data limitations), it provides me with an opportunity to identify some avenues for future research which are as follows. Firstly, I would like to extend the first chapter of this thesis by exploring the association of ODSP recipient characteristics and the transition from disability benefits to work. This can be done by merging the Longitudinal Administrative Databank (LAD) and the MCSS files, if permitted. Secondly, I would like to investigate the impact of policy changes; ODSP work incentives – earning exemption and transitional health benefits – on the labor market participation and time on disability benefits and how do these effects differ across different disability types, socio-economic and demographic groups. Thirdly, I would like to extend the third chapter of this thesis by exploring the impact of the country of the origin of immigrant ODSP benefit recipients of the immigrant use of ODSP benefits. Unfortunately, this information is not available in the MCSS files. Finally, I would like to explore the impact of labor market conditions on transitions rates and disability benefit duration across socio-economic and demographic groups. Existing literature (e.g., Rupp and Stapleton 1995; Cai and Gregory 2004) find that recession raises disability benefit take-up, but that economic recovery does not increase the outflows. It would be interesting to see if benefit receipt patterns and transition rates differ across Ontario's two main social welfare programs; ODSP and Ontario Works (social assistance) during a recession and a recovery.