Describing unmet needs among adults with cerebral palsy and autism spectrum disorder: An examination of the 2012 Canadian Survey on Disability

Abstract

Background: Communities and workplaces benefit when everyone can participate equally in everyday life but a better understanding of the diverse service and support needs of those with different Developmental Disabilities (DD) is needed.

Purpose: Describe the unmet employment, education and daily needs of adults with autism spectrum disorder (ASD) and cerebral palsy (CP) in Canada to inform policy development.

Methods and procedures: The 2012 Canadian Survey on Disability was used to study a sample including working age (15-64 years old) individuals with self-reported DD, CP and ASD. We use ICD-10 codes to identify those with CP and ASD and describe the self-reported barriers that those with ASD and CP face in their everyday activities, education and employment.

Outcomes and results: Employment outcomes are lowest for those with DD compared to any other disability and three quarters report that their disability prevents them from participating in the labour force. Individuals with CP and ASD report a high level of unmet needs that differ in terms of educational, vocational and daily living supports.

Conclusions and implications: Policy needs to better address service and support gaps related to daily activities, education and inclusion in the work force in Canada.
1. Introduction

Developmental Disabilities (DD) refer to a heterogeneous group of conditions with onset in the developmental period characterized by impairments of personal, social, academic or occupational functioning (American Association on Intellectual and Developmental Disabilities, 2010; American Psychiatric Association, 2016; Sullivan et al., 2011). People with DD have poorer health, lower education achievement, fewer economic opportunities and higher rates of poverty than people without disabilities. The lack of services available to individuals with DD and the obstacles faced in their everyday lives, have been identified as key barriers (World Health Organization, 2011b).

Canada currently has no comprehensive legislation protecting rights of people with disabilities to participate in education, work and daily activities. Consultation however has begun on planned accessibility legislation (Government of Canada, 2016). A better understanding of the experiences of those with DD pertaining to education, employment and barriers accessing services can help in designing policies to address these gaps and plan for greater inclusion of future generations (United Nations General Assembly, 2006; World Health Organization, 2011a).

The first step in polices for efficient and equitable services for those with DD is a better understanding of needs and challenges. Developmental deficits vary from specific limitations of learning or control of executive functions to global impairments of social skills or intelligence.
As a result, service and support needs can vary within those with DD. There is very little data in Canada describing how adequately services and supports are meeting the diverse needs of this population (Haveman et al., 2010; Ouellette-Kuntz et al., 2005; World Health Organization, 2011b).

The lack of comprehensive data (administrative or population-based) about individuals with DD makes it difficult to estimate prevalence which can help with predicting and planning for the service requirements of the population locally or provincially. The prevalence of DD in Canada is estimated to be approximately 1 to 3 percent of the whole population, with many now living longer than earlier generations (Ouellette-Kuntz et al., 2005; Sullivan et al., 2011). There is a clear relationship between age group and prevalence with the rates for the younger age groups with DD being over two times higher than the rates of older age groups (Lin et al., 2013). Understanding the unmet needs of adults with DD will help address current and future challenges for children with DD and their families.

In this paper we expand on Statistics Canada’s recent brief report on needs of adult Canadians with DD (Bizier, 2015) and focus on two particular DD; those with autism spectrum disorder (ASD) and cerebral palsy (CP). ASD and CP are two DD that are among the most common chronic conditions resulting in disability in children and a better understanding of services and supports throughout the lifespan is needed (Human Resources and Skills Development Canada, 2006). ASD is marked by impaired social interaction, repetitive behaviors, restricted interests and impaired communication (American Psychiatric Association, 2013). CP is marked by disorders in the development of movement and posture, inducing lifelong mobility limitations.
(American Psychiatric Association, 2013). We hypothesize that those with ASD or CP have diverse service and support needs. We compare and contrast disability-specific experiences and self-reported barriers pertaining to education, employment and available supports and services for the broader category of DD, compared to the outcomes for ASD and CP. By examining outcomes for specific DD, we identify common challenges and unique needs within this population to inform national disability policy development in Canada.

2. Methods

2.1 Data and variables

We use Statistic Canada’s master file of the 2012 Canadian Survey on Disability (CSD)\textsuperscript{1} to empirically investigate our hypothesis that needs of those with ASD and CP are different than those with other DD. The CSD is a post-survey of the 2012 National Household Survey (NHS) and individuals are selected based on their responses to the filter questions in the NHS. The CSD provides information about Canadian adults whose daily activities are limited because of a health related condition. This information is used to plan and evaluate services, programs and policies for adults with disabilities to help enable their full participation in society. We investigate barriers that those with ASD and CP face in their everyday activities, education and employment and how their experiences are different than those with other DD. We furthermore

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\textsuperscript{1} The CSD includes only those who live in private dwellings and excludes those living in nursing houses and collective dwellings.
investigate how existing supports and services meet needs of those with ASD and CP compared to the broader population with DD or general disability.

Our study sample includes working age (15-64 years old) individuals with self-reported DD, ASD and CP. The questionnaire of the 2012 CSD includes questions asking about respondent primary and secondary disabilities which limit their everyday activities. We use these ICD-10 codes\(^2\) to identify those with CP and ASD. The sample of individuals with CP includes those with primary or secondary disabilities coded as G801, G902 or G909. The sample of individuals with ASD includes those with primary or secondary disabilities coded as F840 and F845. Respondents who have answered “yes” to the question asking “Has a doctor, psychologist or other health care professional ever said that you had a developmental disability or disorder? This may include Down syndrome, autism, Asperger Syndrome or mental impairment due to lack of oxygen at birth, etc.” are included in the sample of the individuals with self-reported DD which includes also those with ASD and CP disabilities. CSD furthermore includes seven classifications of disabilities “hearing”, “seeing”, “communication”, “mobility”, “agility”, “pain” and “other limitation” where the last group includes those with “learning”, “memory”, “developmental” and “mental” disabilities. In this study, physical disabilities include those with

\(^2\) Statistics Canada assigns ICD-10 codes to classify respondent’s self-reported disabilities. The ICD-10 is the 10th revision of the International Classification of Diseases, a medical classification list by the World Health Organization (WHO). It contains codes for diseases, signs and symptoms, abnormal findings, complaints, social circumstances and external causes of injury or disease.
“communication”, “mobility”, “agility”, “pain”. The weighted sample size is 141,510 individuals with DD, 11,770 individuals with CP and 29,550 individuals with ASD.

To investigate how the education experience of those with CP and ASD is different than those with other disabilities, we focus on three levels of educational attainment; less than high school, high school and post-secondary. We compared the required, met and unmet needs for education aids and services (i.e. teacher or tutor, extended test time, modified course curriculum, specialized software or devices). We also use a set of variables to investigate how the educational experience of those with CP and ASD is different than the average of those with DD.

To compare the labor force outcomes of those with CP and ASD disabilities with those with DD, we use the employment status (i.e. employed, unemployed or out of labor force), hours worked, amount of total and employment incomes variables. To investigate how the labor force experience of individuals with CP and ASD disabilities are different than those with DD, we use variables related to their experience in work force (i.e. whether they are refused a job, promotion or an interview). In addition, we use variables relevant to job modifications (i.e. modified hours, duty or human support) to investigate whether the work force environment of those with CP and ASD disabilities with those with DD.

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3 Our study identified a weighted sample of 141,510 individuals self-reporting DD between the age of 15 and 64. In a recent Statistics Canada report on DD reported similar, but slightly higher (160,500) numbers for DD from the CSD for those over the age of 15 (Bizier, 2015). The source of this discrepancy lies primarily in the age cut off of 64 we used in our analysis and how variables (such as the labor force) was defined over a determined time period.
ASD is different than those with DD. We investigate reasons for not participating in the labor force and see what work force modifications might enable them to participate in the labor force.

We also use variables indicating required supports for the everyday needs (i.e. housework, personal finance, preparing meals, personal care and medical care) of those with disabilities to investigate how met and unmet needs of those with CP and ASD are different than that of those with DD. Also, we use relevant variables to investigate primary sources of help (i.e. family members, friend, neighbor, paid or unpaid institutions).

3. Results

3.1 Demographics

Findings from the 2012 CSD indicate that 10.08% of 15-64 years old Canadians (2,338,300 individuals) have reported some type of disability. The overall rate of disabilities increased substantially with age, rising from 4.4% among the 15-24 years olds to 16.1% among the 45-64 year olds (table 1). There is no significant difference in the prevalence of total disabilities between men and women for all the age groups. Of Canadians aged between 15-64 years, 0.61% (weighted sample of 141,510 individuals) self-identified as having a DD (table 1). In contrast to the overall disability rate, the prevalence of DD is higher for younger adults, with the 15-24 year old group being double that of older age groups (1.2% vs. 0.5%). Prevalence was higher for men than women (1.6% versus 0.8%). The higher prevalence of DD in the 15-24 age group also holds for those with CP and ASD. CP and ASD comprise respectively 0.05% and 0.13% of the
disabled population. The prevalence of ASD is higher for men than women for all age groups (the male to female ratio of ASD is 5:1).

Almost all 15-64 years old adults with DD report having at least one other type of disability such as a mental health related condition or a memory, learning, physical, seeing/hearing disability. Similarly, almost all of the 15-64 year old adults with CP and ASD disabilities (99.7% and 100%, respectively) reported having at least one other disability. Learning disabilities (75.9%) and mental conditions (59.4%) are more common co-occurring disabilities among younger adults (15-24 years old) with DD while learning (61.1%) and physical (71.0%) disabilities are more common co-occurring disabilities for the older age adults (25-64 years old) (figure 1). Physical disabilities are the most common co-occurring disabilities among those with CP while intellectual disabilities are more common among those with ASD.

3.2 Employment

3.2.1 Labor force status

Working age adults with DD have the lowest Labor Force Participation (LFP) rate of any individuals self-reporting with at least one disability (34.5% vs. 63.4%). The LFP rate of the working age adults does vary; with the average for CP (34.5%) being the same as that of those with DD while LFP for ASD was lower (21.5%) (figure 2). The employment rates for CP (18.9%) and ASD (14.3%) are both lower than that of those with DD (24.1%). The weekly hours of work of those with CP (18.8) and ASD (16.1) who are employed are much lower than those with DD (27.1).
3.2.2 Disability in the workplace

One in four employed working age adults with ASD reported that their employer is not aware of their disability where the corresponding ratio for those with DD is one in ten (table 2). Almost all employed working age adults with CP have reported that their employer is aware of their disability (table 2). This might be due to the higher rate of a visible physical disability in those with CP. Among those with CP who were in labor force, 41.5% believed that their disability was a disadvantage to employment and 40.3% believed their employer thought this (table 2). Over half of respondents with CP in the labour force believed they had been refused a job or an interview because of their disability and 11.8% reported being refused a promotion due to CP. Of those with ASD in the labor force, 22.4% perceived their disability as an employment disadvantage and 19.3% believed their employer perceived this. Close to a quarter of respondents with ASD in the labour force believed they had been refused a job or an interview because of their disability and 11.0% reported being refused a promotion due to ASD (table 2).

3.2.3 Job modifications

Working age adults with CP and ASD reported needing more support in the workplace than other DD where about half of those in the labor force (51.0% and 45.4% respectively) required at least one type of job modification (table 2). More than half of those with CP and ASD who require some sort of job modification (54.9% and 62.3% respectively) reported that some of their required modifications were not available in the workplace. A modified duty was found to be the most frequently reported need for both those with CP and ASD (34.0% and 29.5%, respectively).
3.2.4 Not in the labor force

About three-quarter of working age adults with DD, CP and ASD (72.0%, 69.2% and 74.8%, respectively) who were not in the labor force reported that their disability prevents them from participating in the labor force (31% and 25% for CP and ASD, respectively). The most frequently reported reasons for not being in the labor force for those with CP and ASD includes: inadequate training or experience, lack of local job opportunities, unsuccessful past attempts, discrimination and fear of losing additional supports. Among working age adults with CP and ASD who were not participating in the labor force, 36.4% and 16.8% respectively reported that they might look for a job within next 12 months. Motivations for looking for a job for those with ASD includes; 14.9% expecting their condition to improve, 6.2% expecting workplace changes/improvements and 26.2% planning to take training to improve employability (table 3). Similar data was not available for CP.

3.3 Activities of Daily Living Supports

A vast majority of those with DD (90.8%), CP (82.2%) and ASD (92.2%) reported needing help with some aspect of everyday life where 87.8%, 84.8% and 89.9%, respectively have received help with at least one type of their everyday activity (figure 3). The majority report having at least one unmet need (65.8%, 52.5% and 72.5% respectively for those with DD, CP and ASD) (figure 3). Help that was received was contingent on adequate support provision. “Personal finance” (40.7%) and “getting appointment and running errands” (34.6%) were the most commonly met needs for those with DD. The most commonly met needs for those with CP
disabilities were “housework” (41.6%), “getting appointment and running errands” (38.3%) and “preparing meals” (39.8%) (figure 4). The most commonly met needs for those with ASD disabilities were “personal finance” (51.5%), “getting appointment and running errands” (26.9%) and “personal care” (25.1%) (figure 4).

For all groups of DD, help with the everyday activities is most likely to come from family members. The next most commonly reported source of help for those with DD is “family member-not live in” (31.2%) or “friend or neighbor” (32.4%) whereas “paid organization” provided 20.1% of help (table 4).

3.3.1 Income

The median and mean annual gross personal income of working age adults with DD is about one-third that of those without disabilities (Bizier, et. el., 2015). The median annual gross personal income of working age adults with CP and ASD are almost the same as that of those with DD ($10,800, $10,800 and $10,200 respectively for those with DD, CP and ASD) (table 5). The mean annual gross personal income of those with CP ($14,700) and ASD ($13,700) however, are lower than that of those with other DD ($15,700). Government transfers are the main source of personal income for the majority of the working age adults with DD (69.1%), CP (59.3%) and ASD (63.0%). In contrast, only 18.7% of those without disabilities rely on government transfers as their main source of personal income (Bizier, 2015).

Being employed however does not increase the income levels of disabled individuals dramatically above that received from government transfers. Among working age adults with
DD who were employed, the median and mean annual employment income (wages, salaries and self-employment incomes) are $2,300 and $16,500, respectively. The median and mean annual employment income for those with CP is $180 and $18,700 respectively. Those with ASD made less with the median and mean annual employment income at $2,900 and $6,700 (table 5).

3.4 Education attainment, supports and services

Educational attainment of working age adults with DD is lower than those with other disabilities where the portion of those with DD who did not complete high school (51.0%) is twice (21.9%) as that of with other disabilities (figure 5). Notably, a majority of those with ASD (67.6%) did not complete high school. In contrast, those with CP have the highest rate of high school graduation (40.2%). The rates of high school completion are quite similar between those with (28.1%) or without a disability (26.7%) or with DD (29.5%) (figure 5). Half of the working age adults with a disability reported having post-secondary education, similar to that of those with no disability (57.7%). The corresponding rates are much lower for those with DD (19.5%). These rates range within DD, as those with CP have higher rate of having post-secondary education than those with ASD (33.4% vs. 4.5%).

More than half (59.1%) of the 15-64 years old adults with DD who were students or had recently attended school reported needing at least one education aid or service (figure 6). Larger portions of those with CP and ASD disabilities (89.2% and 75.6%, respectively) reported needing at least one education aid or service. Less than one in five who have needs for educational aid or services have reported having unmet needs (13.9%, 16.8% and 18.5% respectively for those with DD, CP
The most commonly required supports for those with DD, CP and ASD disabilities are “teacher’s aide and tutor”, “extended test time” and “extended test time” where about nine in ten have reported that these needs are met (figure 6). Technology related supports such as specialized software, audio or e-book or recording devices overall are the least frequently needed and provided aids. Those with CP more frequently than others have reported needing technology related aids. Within technology related aids, “specialized software” is the most frequently needed aid for those with DD (26.8%), CP (41.3%) and ASD (33.2%).

**Effects of disability on educational experience**

More than half of the working age adults who were students or had recently been in school and have DD (61.8%), CP (63.9%) or ASD (50.2%) have reported that their disability influenced their educational experience (table 6). These disabilities influence individual’s choice of course or career, number of courses taken, length of degree, need for special education classes and experiencing social exclusion. More than a quarter of those with DD (29.0%), CP (32.3%) and ASD (26.0%) had to leave their community to go to school. A relatively large portion of adults with DD (43.2%), CP (58.7%) and ASD (57.0%) have reported being bullied at school because of their disabilities (table 6). This is in line with the findings of (Zaresani, 2015) which shows that those with ASD might be subject to discrimination and social stigma more often than those with the other DD since, their lower educational attainments and labor force outcomes than others are not due to their observable characteristics.
Discussion

Those with chronic conditions or special health care needs have been shown to have poorer access and quality of healthcare services compared to those without special healthcare needs (Cheak-Zamora & Thullen, 2016). However, the needs of those with DD go beyond the healthcare system. Barriers for employment services exist in the gap between the medical, education and vocational services systems. Transition planning can help to link these systems and improve employment and optimize community participation (Huang et al., 2013). Effective policy and interventions should consider activities of daily living, educational attainment and employment as important outcomes of treatment received by individuals with DD (WHO, 2011). Inclusion and employment enhances quality of life, cognitive functioning and the overall wellbeing of persons with DD by offering an opportunity for economic self-sufficiency, financial security, independent living, greater participation in the community and increased self-esteem (Joshi, Bouck, & Maeda, 2012; Walsh, Lydon, & Healy, 2014). Importantly, younger adults with DD list work and independent economic life as two of the most important life domains related to their health and well-being (Liptak, 2008; Stevenson, Pharoah, & Stevenson, 1997).

Adults with disabilities are less likely than others to be employed, both in Canada (Brown & Emery, 2010; Statistics Canada, 2008) and other parts of the world (Holland et al., 2011; Jones, 2008). Labor outcomes of adults with DD are the lowest among all the other disability groups. Among those with DD, labor outcomes of those with ASD and CP are quite different than the others and the estimated outcomes are quite variable depending on age groups, demographics, severity of disability considered and inclusion of part-time or sheltered employment. The
estimated employment rates of adults with ASD range from 10% to 50% (Hendricks, 2010; Levy & Perry, 2011; Shattuck et al., 2012). Employment rates of 36-50% also have been reported for adults aged 20-33 with CP in Canada (Michelsen, Uldall, Kejs, & Madsen, 2005; Young et al., 2006). Our estimated employment rates from 2012 CSD are 18.8% and 16.1% respectively for those with CP and ASD.

Most of the employed individuals report that their disability is a disadvantage to their employment. Particularly, those with CP and ASD face particular disadvantage in the job interview and job offer process. Over fifty percent of those with CP in the labour force report that they were refused an interview and refused a job due to their disability. These rates are lower for those with ASD at 19% and 25%, respectively. A contributing factor might be the need for job modification in the workplace since about half of those in the labour force require at least one job modification (such as modified hours, duties or human support). There is a clear need for further support in terms of job modification since 54.9% of those with CP and 62.7% of those with ASD reported that all required job modifications were not available in their workplace.

Given these challenges with employment in Canada, unemployment rates of those with CP and ASD in Canada are lower than those in the U.S. (11.8% vs. 30.3% for those with CP and 6.8% vs. 50% for those with ASD) (Huang et al., 2013; Shattuck et al., 2012). There has been significant progress in legislation and policy relevant to employment of people with intellectual disability in the United States to both protect basic rights, adequate training and incentivizing employers to hire job-seekers with disabilities (Monteleone, 2016). While Monteleone comments there is more work to be done on the implementation of this legislation, we suggest such policies
contribute to higher employment rates in the U.S. Notably, in Canada, 72% of those with DD report that their disability prevents labour force participation. We suggest that these findings indicate that a major barrier to employment is actual participation in the labour force, as the participation for those with DD is half that of all disabilities.

Some working age adults with CP and ASD might have severe disabilities and might not be able to work. Some others are able to work but do not work because of employer and work place relates issues such as workplaces that are physically inaccessible, discriminatory hiring practices, needing training or needing workplace modifications. Notably, some respondents with DD indicate that they would look for a job in the next 12 months if they had more training or workplace conditions changed. Without these changes, these individuals remain unemployed or give up looking for work altogether. This can have profound impacts on all aspects of life as competitive employment, supported employment, volunteer work and purposeful daytime activity all provide structure and community integration which enhance quality of life (Dooley, Fielding, & Levi, 1996; Holwerda, van der Klink, Groothoff, & Brouwer, 2012).

The low labour force participation of those with ASD and CP also suggests that persons with these disabilities have limited opportunities for economic independence through their earnings, as they work fewer hours per week and earn less on average than typical employees. It has been shown in the U.S. that the majority of those with ASD are paid less than the national minimum hourly wage, hold jobs that are generally unskilled, low-paying and unstable (Chiang, Cheung, Li, & Tsai, 2013; Levy & Perry, 2011). The median personal income (before taxes) of working age adults is less than one third of that of those without disabilities. Notably, our analysis
identifies that those who are employed with CP and ASD on average don’t garnish an income that is substantially higher than the income others receive from government transfers and are not in the labour force. This disincentive to work associated with the structure of government support programs has previously been reported for those with CP. Murphy et al. found in a U.S. study that of the 53% of adults with CP competitively employed, 22% earned an income high enough such that their work advancement would result in termination of disability benefits (K. P. Murphy, G. E. Molnar, & K. Lankasky, 2000).

Our analysis supports findings in the literature that educational attainment, vocational training/education, work incentives and socialization are important factors that impact employment outcomes for individuals with DD (Dudley. C., 2015; Huang et al., 2013). Employers play a critical role in addressing high unemployment rate and low labour force participation experienced by persons with disabilities. Employer attitudes toward persons with disabilities are an important factor in the perceptions of high levels of workplace discrimination such as being refused a job or interview due to a disability (Blanck, 1998; Huang et al., 2013; Nicholas, Attridge, Zwaigenbaum, & Clarke, 2015).

Vocational rehabilitation, including training and job modifications are opportunities to improve labor force participation for those with ASD and CP. About half of the adults with CP and ASD in the labor force report needing at least one job modification; however, 54.9% and 62.3% of those with CP and ASD respectively reported that some of their required modifications are not available in their workplace. On-the-job training/support, job placement assistance, maintenance, and rehabilitation play central role in employment success (Dudley. C., 2015; Huang et al., 2013;
Nicholas et al., 2015). However, access to formal vocational supports and training has long been a major limitation for those with DD (Sillanpaa, Piekkala, & Pisirici, 1982). Dissatisfaction with vocational supports for CP and ASD is reported to be a barrier to employment (Nicholas et al., 2015; Vogtle, 2013).

The unmet needs of those with DD go beyond vocational support. Transitioning to independent community living and participating in economic and social activities requires providing a range of support and assistance services, and supporting informal caregivers (WHO, 2011). Approximately 90% of those with DD need at least one type of support with daily activates such as housework, appointments, personal finance, chores, meal preparation, personal care or medical care. Half of those with CP report having unmet needs for their daily activates, while 72% of those with ASD report having unmet needs for this support. Lack of support with everyday activities is likely to be a major contributing factor towards the challenges in participating in the labour force.

Education beyond high school is reported to be one of the most significant factors in achieving competitive employment (Dudley. C., 2015; Kevin P. Murphy, Gabriella E. Molnar, & Kathleen Lankasky, 2000). Those with DD have the lowest educational achievements among other disability groups (Bizier, 2015). Over 50% of those with DD have less than high school education and only 19% have post-secondary education. These outcomes are even lower for those with ASD, as 67% of them have not completed high school. Those with CP have higher educational attainment in both high school and post-secondary than others with DD, however post-secondary education levels still are lower than that for the other disabilities.
Education lays a groundwork for adulthood employment and independence. Our findings suggest that those with DD, and especially those with ASD and CP, face challenges within the education system. The transition period out of the school system has been identified as a critical period for those with DD (Leonard et al., 2016; McKenzie, Ouellette-Kuntz, Blinkhorn, & Demore, 2016). For CP and ASD specifically there is a high level of need within the education system. Half of those with DD report requiring an education aid or service, compared to the 75% of those with ASD and close to 90% of those with CP. The most common needs for these populations are a teacher aid or tutor, extended test time and modified course curriculum. A relatively smaller portion of the population with CP and ASD report needing specialized software, an audio or e-book device or a note taking device. Over 30% of those with ASD who reported needing these educational supports did not receive them, where most of those with CP received their needs.

Unmet needs within the education system can amplify the perception of negative effects of disability on educational experience. Social inclusion is identified as a challenge for adults with CP and ASD who have recently been in school, with over 57% reporting perception that people avoid them in school or are bullied due to their disability. A similar percentage also report attending special education classes in regular school. A third had to leave their community to attend a school which better met their needs.

Family supports for individuals with disabilities, especially for those with DD, are critical in successful transition from youth to adulthood. Family involvement must be carefully managed to support a positive contribution to the achievement of transition goals (Westbrook et al., 2014). This emphasizes the need for more understanding of the role family plays in transition for those
with DD; models for better transitional success remains an understudied area (Dudley. C., 2015). We find that for those with CP and ASD the majority of support for daily living activities comes from family members, friends and neighbors, particularly those in the same household. Less than a third of the support comes from a paid organization. It has been identified that family involvement must be carefully managed to support a positive contribution to the achievement of transition goals (Westbrook et al., 2014). This emphasizes the need for more understanding of the role family plays in transition for those with DD.

**Limitations**

A limitation of our study lies in the fact that the CSD refers only to the population living in private households and does not include those living in institutions. This means that the numbers only represent those with ASD and CP living in private households. It is unclear what percentage of these populations live in private residences in Canada. However, we suggest that this population living in private residences is more likely to be able to perform some daily living activities and participate in the labour force. A second limitation is the self-reported nature of the condition specific analysis. The CSD does not include a checklist of diagnosed conditions. The survey asked individuals to self-report their disabilities. These self-reported variables do not definitively identify those with ASD or CP. Therefore these estimates should not be used to represent prevalence, but rather self-reported needs in this self-identified population.

**Conclusion:** Education and employment outcomes of those with DD are the lowest among those with other disability groups. These outcomes are lower for those with ASD and CP. This is due,
in part to a high level of unmet employment, education and daily needs for DD; these range for different DD such as ASD and CP. New Canadian policies are needed to address the high level of unmet needs and improve equality and inclusion in society.

**Acknowledgement:**

We gratefully acknowledge the contributions from NeuroDevNet funded through The Networks of Centers of Excellence program.

This analysis is conducted at the University of Calgary RDC which is part of the Canadian Research Data Centre Network (CRDCN). The services and activities provided by the CRDCN are made possible by the financial or in-kind support of the SSHRC, the CIHR, the CFI, Statistics Canada and participating universities whose support is gratefully acknowledged. The views expressed in this paper do not represent the CRDCN’s or that of its partners.

**Declaration of Interests Section:** None

**References**


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<th>15-24 years (%)</th>
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Table 1: Prevalence of disabilities by age and types of disability, 2012 CSD. Note: *Some statistics are suppressed according to Statistic Canada’s guidelines, since they do not meet Statistics Canada’s vetting criteria.
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<td><strong>Refused a job because of disability</strong></td>
<td>24.9</td>
<td>41.5</td>
<td>22.4</td>
</tr>
<tr>
<td><strong>Refused a promotion because of disability</strong></td>
<td>23.4</td>
<td>51.4</td>
<td>25.0</td>
</tr>
<tr>
<td><strong>Refused an interview because of disability</strong></td>
<td>25.0</td>
<td>11.8</td>
<td>11.0</td>
</tr>
<tr>
<td><strong>Need at least one job modification requirement</strong></td>
<td>19.9</td>
<td>57.8</td>
<td>19.7</td>
</tr>
<tr>
<td><strong>All required job modification needs available</strong></td>
<td>40.3</td>
<td>51.0</td>
<td>45.4</td>
</tr>
<tr>
<td><strong>None of required job modification needs available</strong></td>
<td>32.8</td>
<td>45.1</td>
<td>37.7</td>
</tr>
<tr>
<td><strong>Needs modified hours</strong></td>
<td>28.9</td>
<td>19.5</td>
<td>27.1</td>
</tr>
<tr>
<td><strong>Needs modified duty</strong></td>
<td>26.1</td>
<td>34.0</td>
<td>29.5</td>
</tr>
<tr>
<td><strong>Needs human support</strong></td>
<td>17.9</td>
<td>20.9</td>
<td>26.6</td>
</tr>
</tbody>
</table>

Table 2: Disability in the work force for 15-64 years old by types of disability, 2012 CSD by percentage. Note: Some statistics are suppressed according to Statistic Canada’s guidelines, since they do not meet Statistics Canada’s vetting criteria.*The sample includes those who were currently employed. For the rest, the sample includes those who were currently in the labor force.
<table>
<thead>
<tr>
<th>Reason for not participating in the labour force</th>
<th>Developmental Disabilities (%)</th>
<th>CP (%)</th>
<th>ASD (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inadequate training or experience</td>
<td>18.6</td>
<td>21.5</td>
<td>9.8</td>
</tr>
<tr>
<td>No local jobs</td>
<td>17.7</td>
<td>27.7</td>
<td>11.1</td>
</tr>
<tr>
<td>Unsuccessful in past attempt</td>
<td>16.6</td>
<td>27.8</td>
<td>7.4</td>
</tr>
<tr>
<td>Discrimination</td>
<td>12.0</td>
<td>12.5</td>
<td>5.2</td>
</tr>
<tr>
<td>Fear to loose support</td>
<td>11.9</td>
<td>16.9</td>
<td>3.7</td>
</tr>
<tr>
<td>Work place accommodation is needed</td>
<td>8.4</td>
<td>NA.*</td>
<td>10.1</td>
</tr>
</tbody>
</table>

Table 3. Reason for not participating in the labour force by percentage. Note: * Note: Some statistics are suppressed according to Statistic Canada’s guidelines, since they do not meet Statistics Canada’s vetting criteria.
<table>
<thead>
<tr>
<th>Disability Type</th>
<th>Disabilities (%)</th>
<th>(%)</th>
<th>(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Family member- live in</td>
<td>63.5</td>
<td>63.5</td>
<td>58.4</td>
</tr>
<tr>
<td>Family member- not live in</td>
<td>31.2</td>
<td>22.4</td>
<td>13.7</td>
</tr>
<tr>
<td>Friend or neighbor</td>
<td>18.3</td>
<td>32.4</td>
<td>8.3</td>
</tr>
<tr>
<td>Organization- unpaid</td>
<td>23.9</td>
<td>25.1</td>
<td>15.3</td>
</tr>
<tr>
<td>Organization- paid</td>
<td>20.2</td>
<td>28.1</td>
<td>20.1</td>
</tr>
</tbody>
</table>

Table 4: Type of help received for the everyday activities, 15-64 years old, 2012 CSD by percentage.
<table>
<thead>
<tr>
<th>Effect of Disability</th>
<th>DD</th>
<th>CP</th>
<th>ASD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Choice of course/career influenced by disability (%)</td>
<td>61.8</td>
<td>63.9</td>
<td>50.2</td>
</tr>
</tbody>
</table>

Table 5: Gross income of 15-64 years old adults by types of disability, 2012 CSD *Note:*

Employment income includes wages, salaries and self-employment incomes. The sample includes those who were employed during the reference week.
<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Took fewer courses due to disability (%)</td>
<td>68.9</td>
<td>45.6</td>
<td>61.6</td>
</tr>
<tr>
<td>Took longer to achieve current level due to disability (%)</td>
<td>67.6</td>
<td>55.2</td>
<td>63.4</td>
</tr>
<tr>
<td>People avoided/excluded you in school due to disability (%)</td>
<td>52.9</td>
<td>57.0</td>
<td>59.6</td>
</tr>
<tr>
<td>Attended special education classes in regular school due to disability (%)</td>
<td>56.9</td>
<td>54.5</td>
<td>66.3</td>
</tr>
<tr>
<td>Bullied at school because of disability (%)</td>
<td>43.2</td>
<td>58.7</td>
<td>57.0</td>
</tr>
<tr>
<td>Changed course of studies due to disability (%)</td>
<td>40.1</td>
<td>19.2</td>
<td>30.1</td>
</tr>
<tr>
<td>Education interrupted due to disability (%)</td>
<td>37.0</td>
<td>30.5</td>
<td>24.2</td>
</tr>
<tr>
<td>Changed school due to disability (%)</td>
<td>31.3</td>
<td>NA.*</td>
<td>35.8</td>
</tr>
<tr>
<td>Discontinued education due to disability (%)</td>
<td>32.5</td>
<td>22.0</td>
<td>26.3</td>
</tr>
<tr>
<td>Additional school expenses due to disability (%)</td>
<td>33.2</td>
<td>29.1</td>
<td>33.6</td>
</tr>
<tr>
<td>Left community for school due to disability (%)</td>
<td>28.8</td>
<td>32.3</td>
<td>26.0</td>
</tr>
<tr>
<td>Began school later due to disability (%)</td>
<td>29.0</td>
<td>NA.*</td>
<td>20.8</td>
</tr>
</tbody>
</table>

Table 6: Effect of disability on educational experience of 15-64 years, 2012 CSD The sample includes those who were currently or had recently been graduated. Note: *Some statistics are suppressed according to Statistic Canada’s guidelines, since they do not meet Statistics Canada’s vetting criteria.